



TOSHIBA

SERVICE MANUAL 1550, 1560

PLAIN PAPER COPIER

PAPER FEEDING UNIT MY-1004



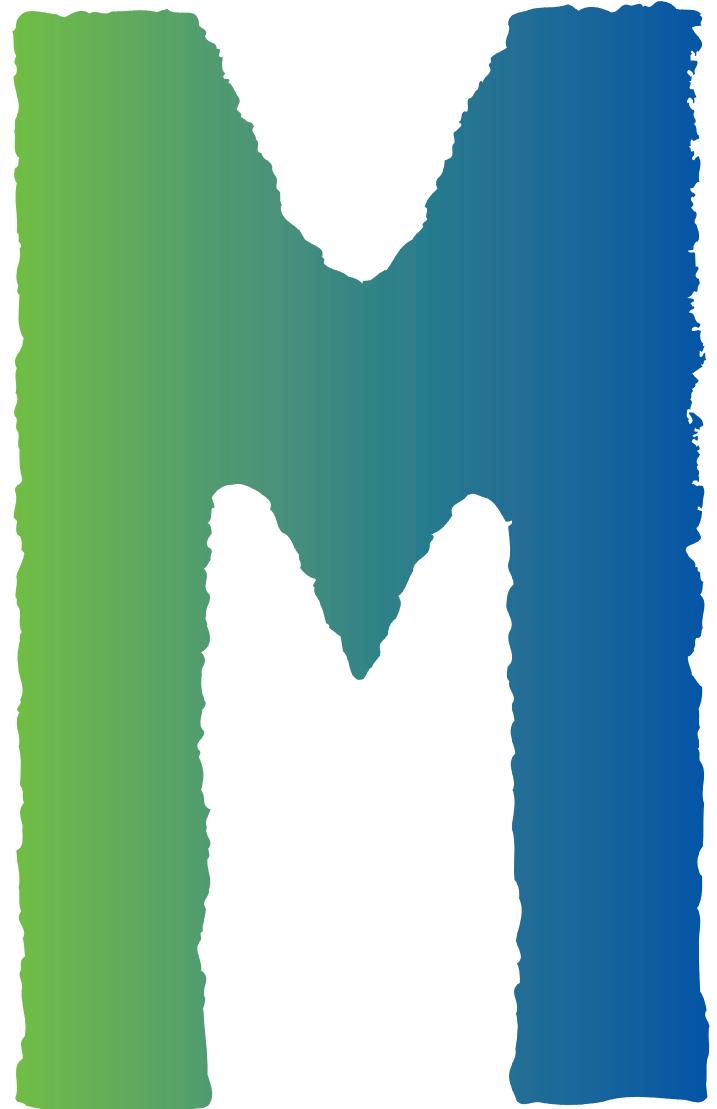
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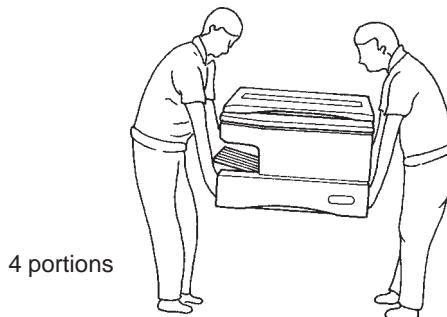


GENERAL PRECAUTIONS REGARDING THE INSTALLATION AND THE SERVICE OF THE 1550/1560/MY-1004

1. Transportation/Installation

- When transporting/installing the copier, using two persons, be sure to use the positions as indicated below.

The copier is fairly heavy and weighs approximately 35 kg (76.8 lb), therefore pay full attention when handling it.



2. Installation

- Be sure to use a dedicated outlet with AC 115V/15A (220V, 240V/10A) or more for its power source.
- The copier must be grounded for safety.

Never ground it to a gas pipe or a water pipe.

- Select a suitable place for installation.

Avoid excessive heat, high humidity, dust, vibration and direct sunlight.

- To insure adequate working space for the copying operation, keep a minimum clearance of 80 cm (31.5") on the left, 80 cm (31.5") on the right and 10 cm (3.9") in the rear.

3. Service of Machines

- Basically, be sure to turn the main switch off and unplug the power cord during service.
- Be sure not to touch high temperature sections such as the exposure lamp, the fuser unit, the damp heater and their periphery.
- Be sure not to touch high-voltages sections such as the chargers and the high-voltage transformer.
- Be sure not to touch rotating/operating sections such as gears, belts, pulleys, etc.
- When servicing the machines with the main switch turned on, be sure not to touch live sections such as the lamp terminal etc.
- Use suitable measuring instruments and tools.

4. Main Service Parts for Safety

- The thermofuse, thermistor, fuse, breaker and door switch, etc. are particularly important for safety. Be sure to handle/install them properly.

5. Notice Labels

- Be sure to check the rating plate and the notice labels such as "Unplug the power cord during service", "Hot area" etc. to see if there is any dirt on their surface or if they are properly stuck to the copier during servicing.

6. Disposition of Consumable Parts/Packing Materials

- Regarding the recovery and disposal of the copier, consumable parts and packing materials, it is recommended to follow the relevant local regulations or rules.

7. When parts are disassembled, reassembly is basically the reverse of disassembly unless otherwise noted in this manual or other related documents. Be careful not to reassemble small parts such as screws, washers, pins, E-rings, toothed washers in the wrong places.

8. Basically, the machine should not be operated with any parts removed or disassembled.

1. SPECIFICATIONS, ACCESSORIES AND OPTIONS

1.1 Specifications

1.1.1 1550

Copy process Indirect electrophotographic process (dry)

Type Desk top

Exposure type Slit exposure with fixed table

Original size Type: Sheets, books and three-dimensional objects

Maximum size: A3 or Ledger

Copy paper

	Size	Thickness
Cassette	A3~A5-R	64~80g/m ²
	Ledger~Statement-R	16lb.~22lb.
Manual	A3~A5-R	64~130g/m ²
	Ledger~Statement-R	16lb.~34lb. } Sheet bypass } feeding only

Special paper: Label paper (type recommended by Toshiba) and OHP film (80 μ m or more in thickness,

type recommended by Toshiba)

– bypass feeding only

Copy speed (sheets/minute)

Paper size	Actual size		Reduction/Enlargement (Cassette/Manual)
	Cassette	Manual	
A4, B5, A5-R LT, ST-R	15	1	8
A4-R, B5-R LT-R	12	1	8
B4, FOLIO LG, COMPUTER	10	1	8
A3 LD	8	1	8

First copy time About 5.8 seconds (100%, A4/LT copier cassette feeding)

..... About 8.3 seconds (100%, A3/LG/LD PFU cassette feeding)

Warm-up time About 28 seconds (100V series), About 28 seconds (200 V series)

Multiple copying Up to 999 sheets

Setting to adjustment mode allows selection of 9, 99, 500 and 999 copies.

Reproduction ratio Actual size 1:1

By setting to adjustment mode, vertical reproduction only can be altered to 1:1.01.

Reduction/Enlargement 3R3E

50, 65, 78, 129, 154, 200% (For U.S.A, Canada)

50, 71, 82, 122, 141, 200% (For Europe)

Paper feeding

	Type	Capacity
Cassette	Front Loading	500 sheets (50 mm or less)
Manual	* Foldable tray	1 sheet

* For Europe

Manual start: At the time of shipping, the copying operation is started by the PRINT key. By inputting data for adjustment mode, it can be changed to auto-start.

Toner supply Automatic density detection and replenishment

Toner cartridge replacement method

Exposure Automatic control and manual control

Weight 35 kg

Power source 110 V – 50/60 Hz

115V – 60 Hz

127 V – 60 Hz

220 V – 50/60 Hz

220~240 V – 50/60 Hz

Power consumption ... 1.5 kW or less

Total counter Mechanical total counter (6 digits)

Machine size See the next page.

1.1.2 1560

The differences from the 1550 are shown below.

Bypass

Copying speed 8 copies/minute (all sizes)

Size A3~A5-R

LD-ST-R

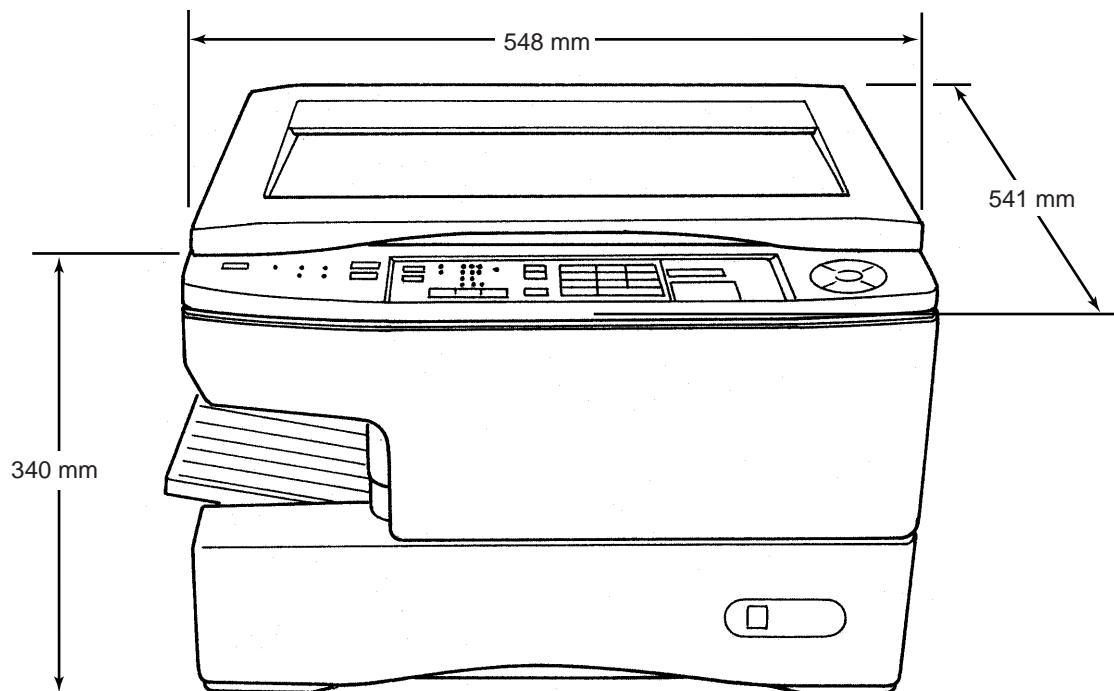
Paper stacking capacity

..... 60 copies

Copy paper size 64~80g/m² : 60 copies stacking
16~22lbs : 60 copies stacking
80~130g/m² : single-sheet feeding
22~34lbs : single-sheet feeding

Weight of machine 38kg

Size of a machine W571 x D541 x H340mm



1.2 Accessories

- Copy receiving tray 1 pc
- Operator's manual 1 pc
- Drum 1 pc
- Lever caps 2 pcs
- Setup report 1 pc

1.3 Options and Supplies

Options

Automatic document feeder	MR-2004LT	660 84890
	MR-2004A4	660 84891
Sorter	MG-1003	660 84838
Key copy counter (6 digit)	MU-8	660 02050
Key copy counter kit	MU-10	660 02051
Counter bracket kit	KN-1550K	660 84840
Cassette	KC-1550AF	660 84841
	KC-1550LF	660 84842
	KC-1550AFE	660 84914
Damp heater kit	MF-1550U	660 84848
	MF-1550E	660 84849
Paper feed unit	MY-1004L	660 84835
	MY-1004AE	660 84913
	MY-1004A	660 84836
Sorter bracket kit (for MG-1003)	KN-1550S	660 84839

For Europe

For Europe

Supplies

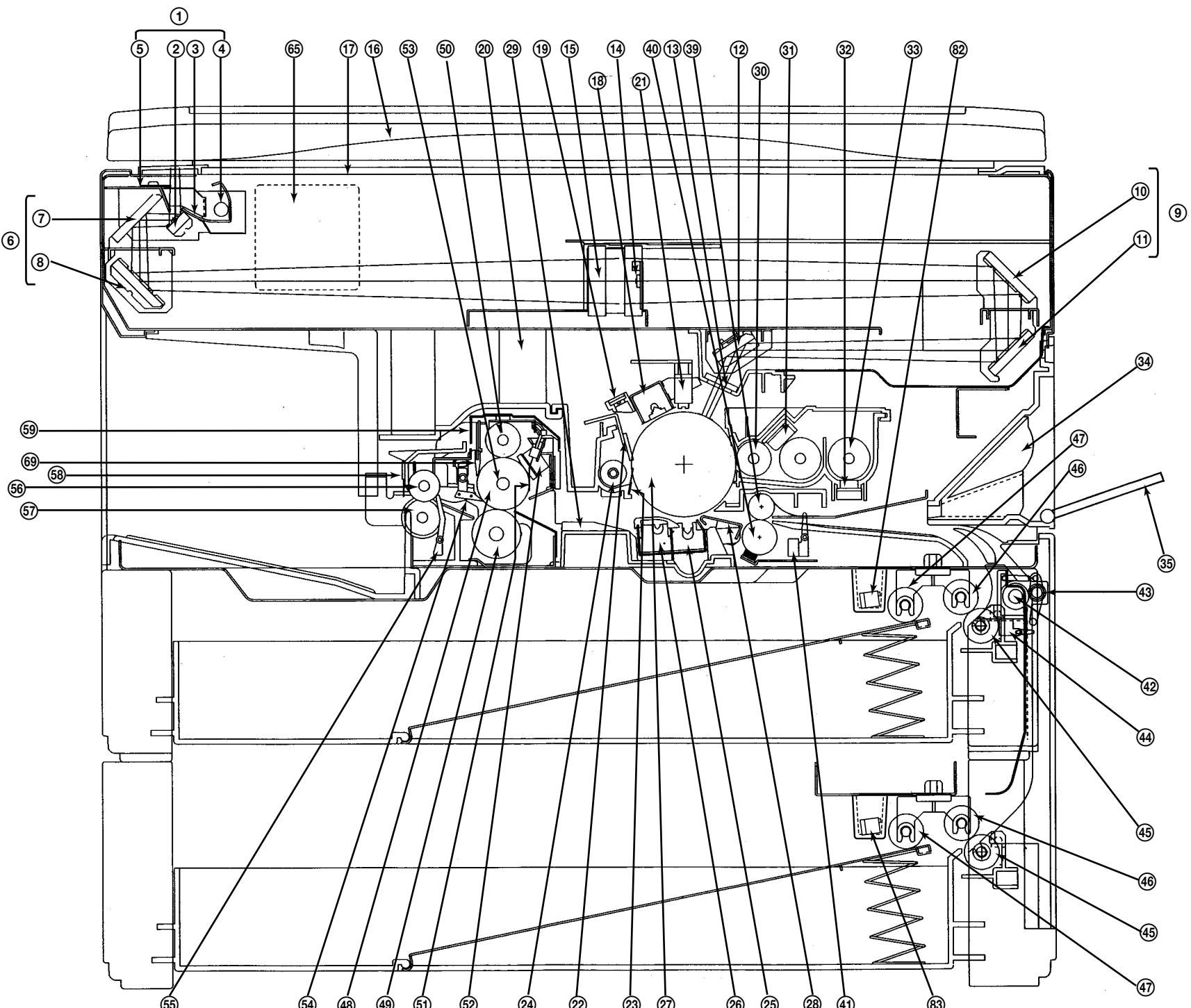
Drum	PS-OD1550	66084854
Developer material	PS-ZD1550	66084853
Toner	PS-ZT1550	66084851
Toner (for Europe)	PS-ZT1550E	66084852
Toner bag	PS-TB1550	66084859
Toner bag (for Europe)	PS-TB1550E	66084860

2. OUTLINE OF THE MACHINE

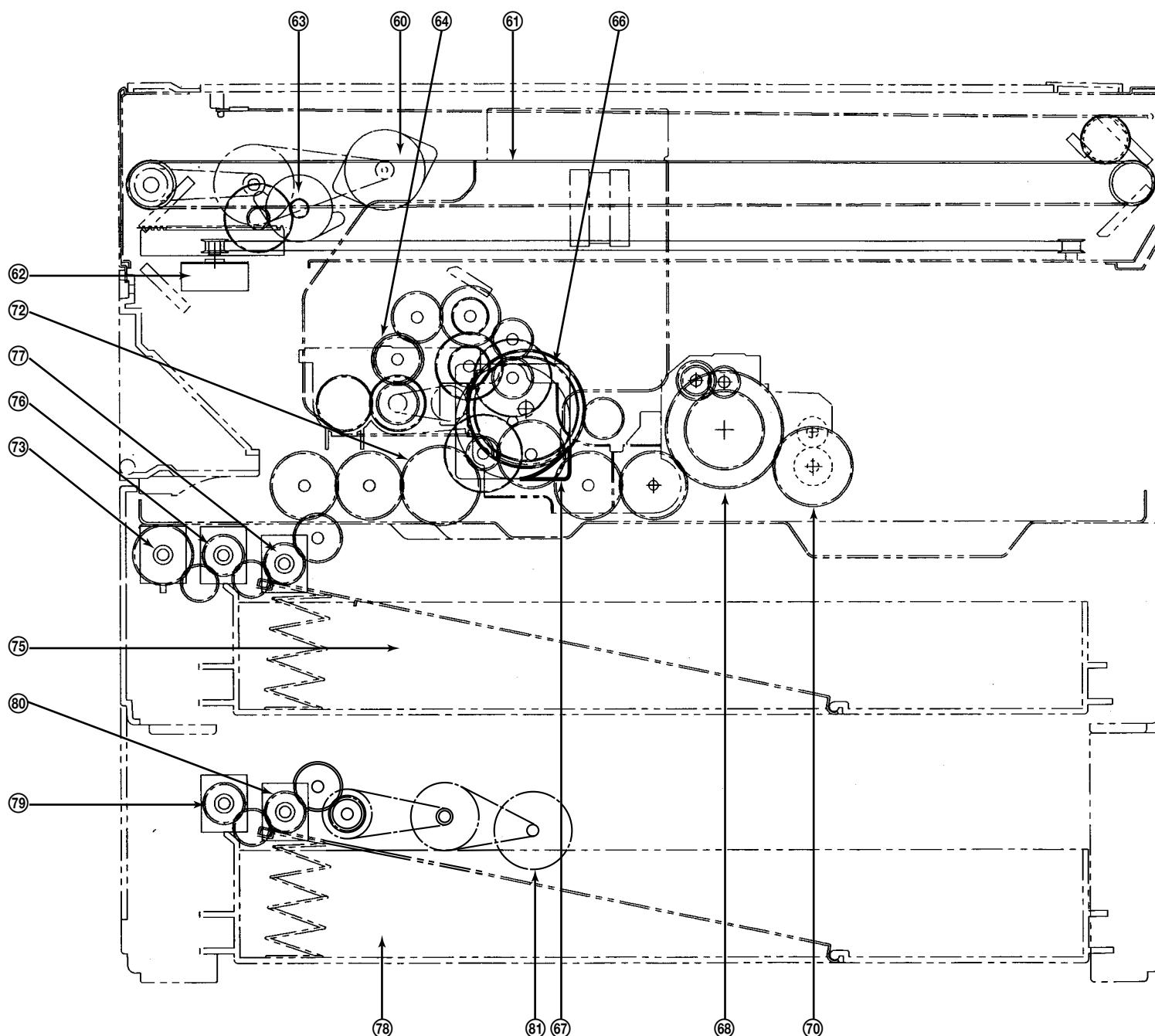
2.1 Sectional Views and Electrical Parts Location Diagram

2.1.1 Front and rear sectional views for the 1550

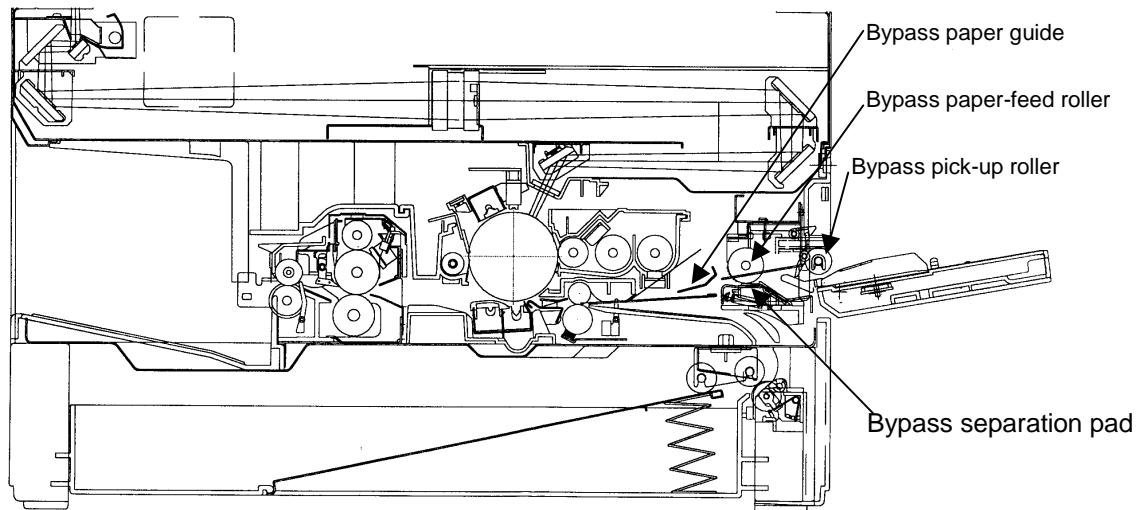
1	Carriage 1	30	Magnetic roller
2	Mirror 1	31	Leveler (doctor)
3	Reflector	32	Auto toner sensor
4	Exposure lamp	33	Mixer
5	Exposure adjustment plates	34	Bypass feed guide
6	Carriage 2	35	Bypass feed tray
7	Mirror 2	39	Aligning roller (upper)
8	Mirror 3	40	Aligning roller (lower)
9	Mirror unit	41	Aligning switch
10	Mirror 4	42	Transport roller (left) (MY-1004)
11	Mirror 5	43	Transport roller (right) (MY-1004)
12	Mirror 6	44	Paper stop switch (MY-1004)
13	Slit glass	45	Separation roller
14	Auto exposure PC board	46	Feed roller
15	Lens	47	Pick-up roller
16	Original cover	48	Heat roller
17	Original glass	49	Heat roller (lower)
18	Main charger	50	Cleaning felt roller
19	Discharge lamp	51	Thermistor
20	Ozone filter	52	Thermostat
21	LED erasing array	53	Heater lamp
22	Main blade	54	Separation claws
23	Recovery blade	55	Exit switch
24	Toner recovery auger	56	Exit roller (upper)
25	Transfer charger	57	Exit roller (lower)
26	Separation charger	58	Discharge brush
27	Drum	59	Fuser guard
28	Pre-transfer bias guide	65	Air filter
29	Transport guide	69	Cleaning blade
		82	Paper empty switch
		83	Empty switch (MY-1004)



60	Scanning motor
61	Carriage drive wire
62	Lens motor
63	Mirror motor
64	Developer-unit drive gear
66	Drum gear
67	Main motor
68	Heat roller gear
70	Exit roller gear
72	Aligning roller clutch
73	Transport roller clutch (MY-1004)
75	Cassette
76	Feed roller clutch
77	Pick-up roller clutch
78	(PFU) cassette (MY-1004)
79	(PFU) feed roller clutch (MY-1004)
80	(PFU) pick-up roller clutch (MY-1004)
81	(PFU) drive motor (MY-1004)

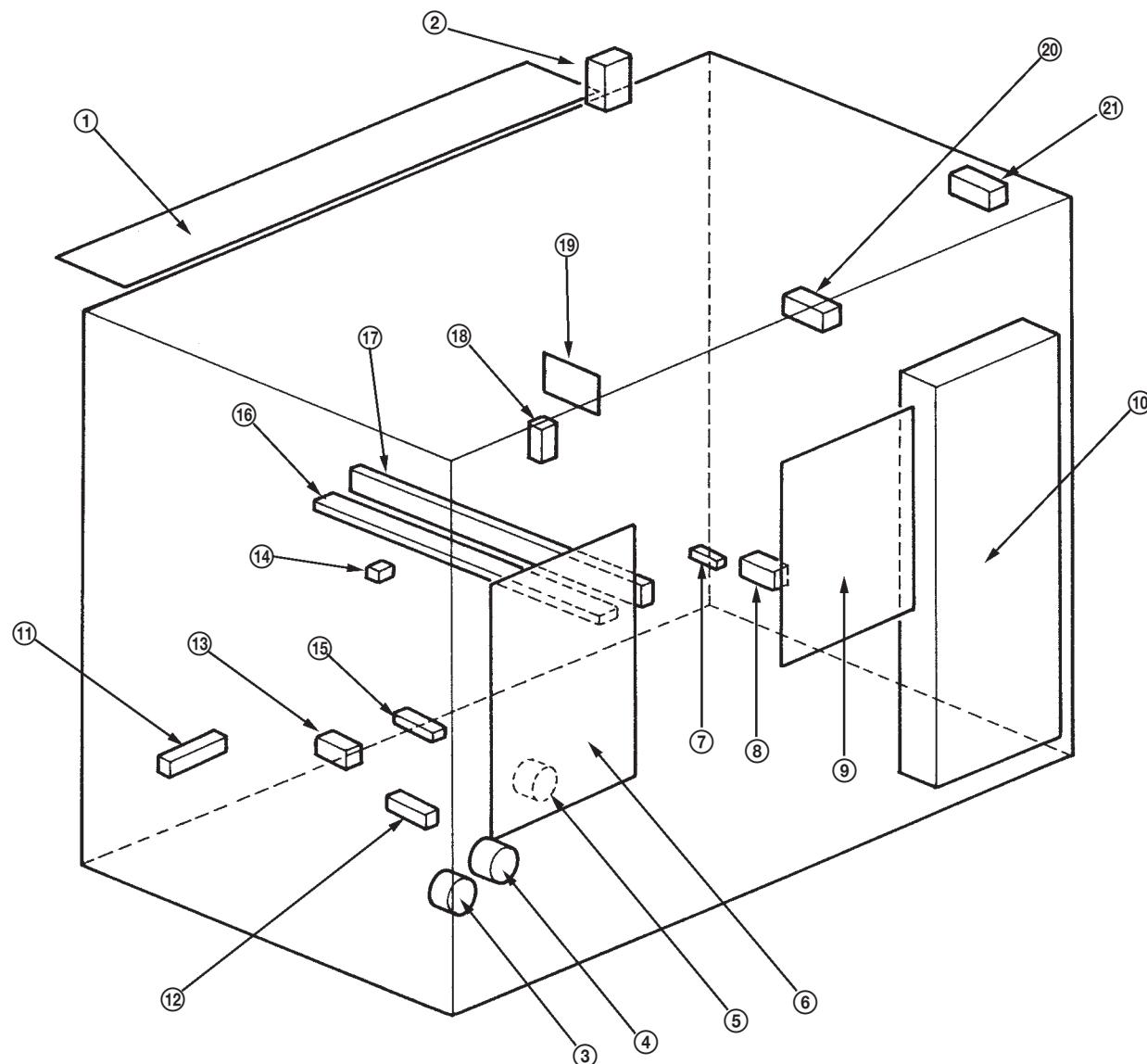


**2.1.2 Front and Rear sectional views for the 1560
(The differences from the 1550)**



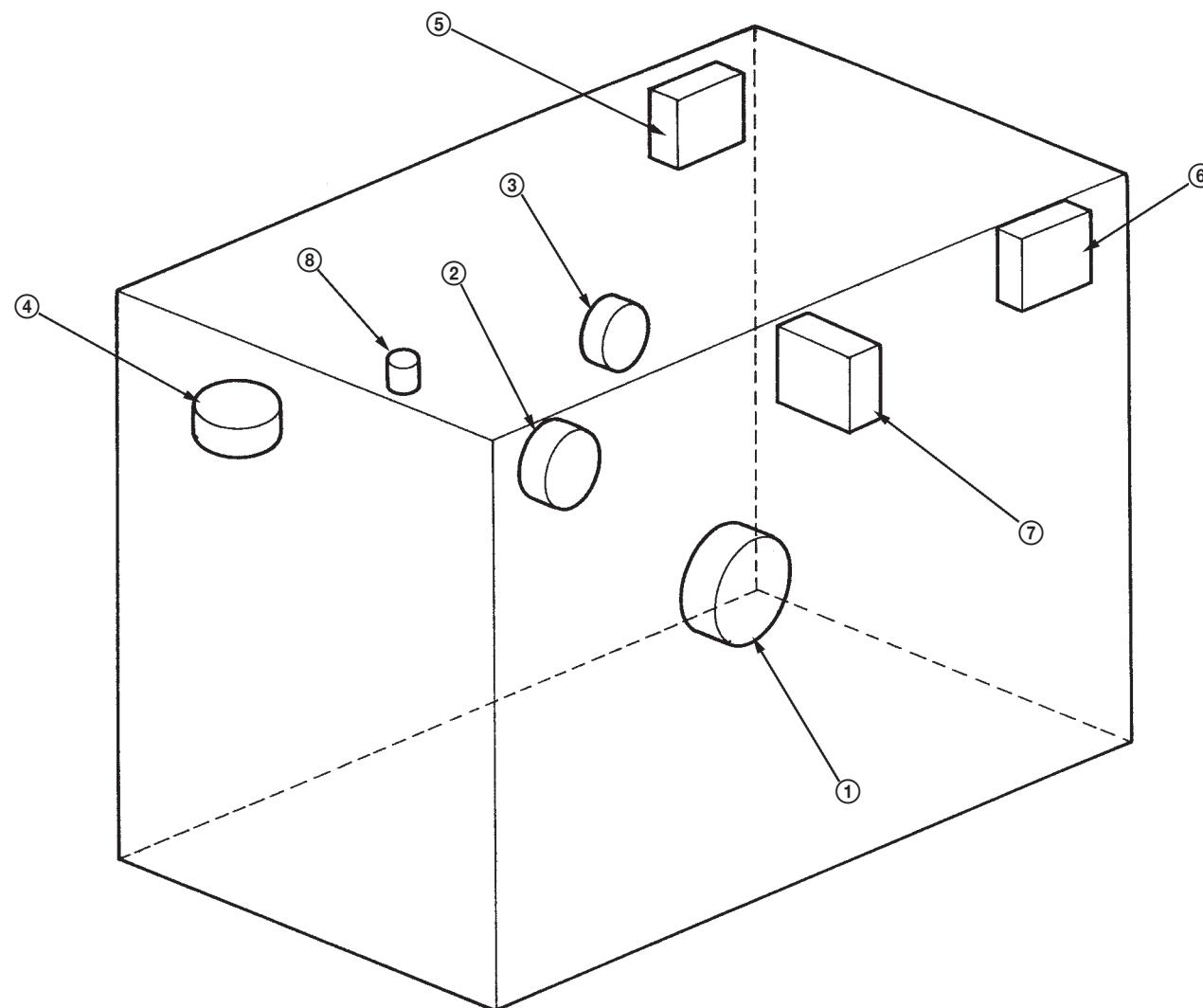
2.1.3 Electrical parts location diagram

[A] DC electrical parts excluding motors



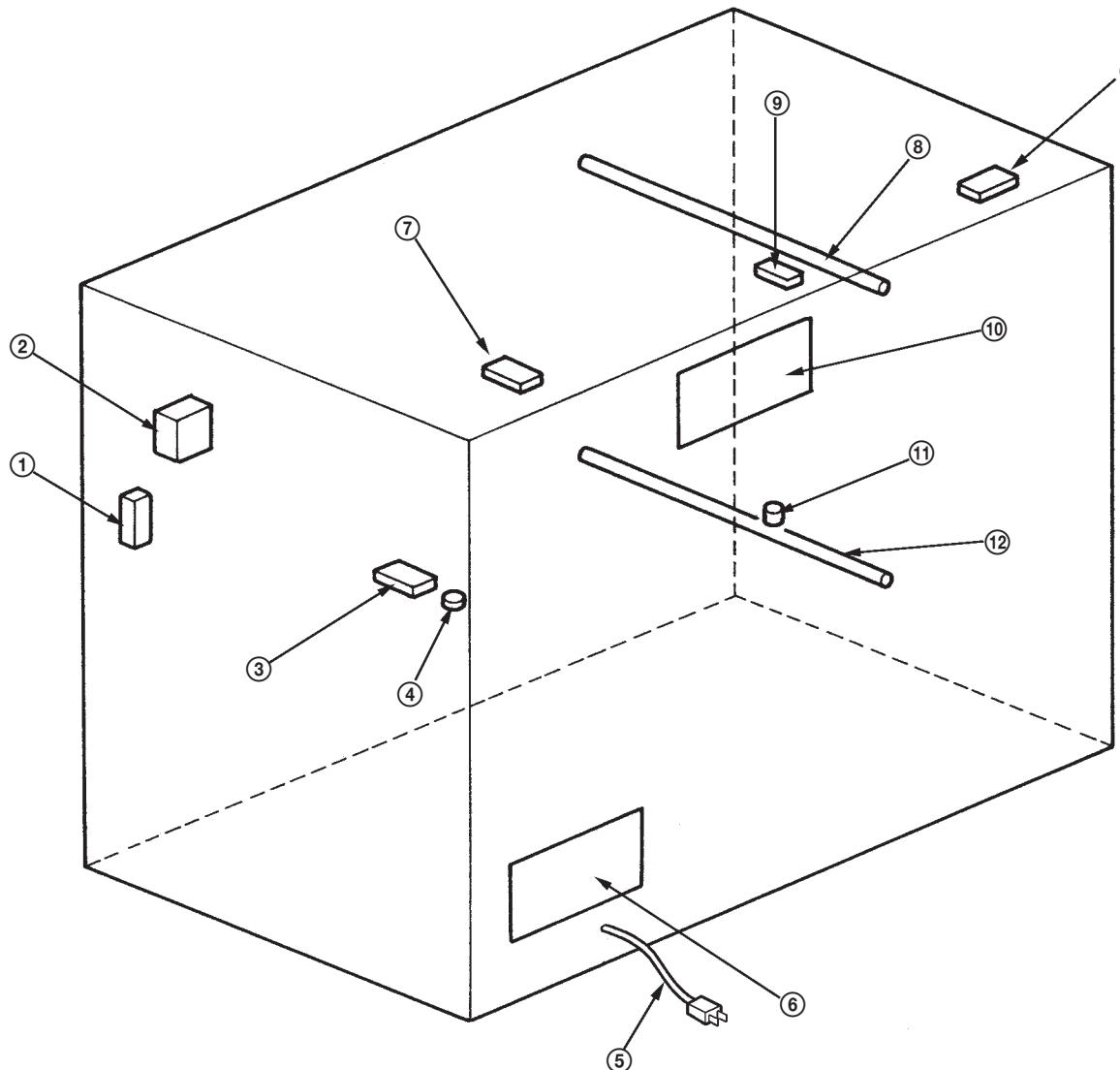
Symbol	Name
1	Control panel PC board (PWA-F-PNL)
2	Total counter (T-CTR)
3	Feed roller clutch (FED-CLT)
4	Pick-up roller clutch (PKUP-CLT)
5	Aligning roller clutch (CLT-REG)
6	High-voltage transformer (PS-HVT)
7	Heat roller thermistor (THMS-HTR)
8	Exit switch (EXT-SW)
9	Logic PC board (PWA-F-LGC)
10	Power supply unit (PS-ACC)
11	Size switch (SIZE1-SW)
12	Paper empty switch (EMP2-SW)
13	Aligning switch (RGT-SW)
14	Toner-full switch (T-FUL-SW)
15	Auto-toner sensor (SNR-ATC)
16	Eraser lamp PC board (ASM-F-ERS)
17	LED discharge array PC board (ASM-DCH)
18	Mirror switch (MRR-SW)
19	Auto-exposure PC board (PWA-F-AES)
20	Lens switch (LNS-SW)
21	Home switch (HOME-SW)

[B] Electrical parts such as motors



Symbol	Name
1	Main motor (MAIN-MTR)
2	Scanning motor (SCN-MTR)
3	Mirror motor (MRR-MTR)
4	Lens motor (LNS-MTR)
5	Front optics fan (OPT-FAN-F)
6	Rear optics fan (OPT-FAN-R)
7	Exit fan (EXIT-FAN)
8	Toner motor (TNR-MTR)

[C] AC electrical parts



Symbol	Name
1	Door switch (DOOR-SW)
2	Main switch (MAIN-SW)
3	Damp heater L (D-HTR-L)
4	Thermostat
5	AC power cable
6	Fuse PC board (PWA-F-FUS)
7	Damp heater U1 (D-HTR-U1)
8	Exposure lamp (EXPO-LAMP)
9	Thermofuse (FU-EXPO)
10	Lamp regulator PC board (PS-LRG)
11	Heater thermostat (K-THMO)
12	Heater lamp (HTR-LAMP)
13	Damp heater U2 (D-HTR-U2)

2.2 Symbol and Function of Electrical Parts

[Go to 1550 DC Harness Connection Diagram](#)

[Go to 1560 DC Harness Connection Diagram](#)

(1) Motors

* Refer to SERVICE PARTS LIST ED-1550

Symbol	Code name	Function	Remarks	*Page/item No.
M1	MAIN-MTR (Main motor)	Drives the drum, developer and heat roller	IC motor	P9, I1
M2	SCN-MTR (Scanning motor)	Scans the optical system	Pulse motor	P8, I14
M3	LNS-MTR (Lens motor)	Drives the lens unit	Pulse motor	P8, I4
M4	MRR-MTR (Mirror motor)	Drives the mirror unit	Pulse motor	P8, I4
M6	OPT-FAN-F (Optics fan (front))	Cools the optical system	IC motor	P3, I8
M7	OPT-FAN-R (Optics fan (rear))		□60	
M8	EXIT-FAN (Exit-fan)	Cools the drum and cleaner	IC motor: □60	P3, I8
M9	TNR-MTR (Toner motor)	Replenishes the toner	Brush motor	P17, I31

(2) Electromagnetic spring clutches

Symbol	Code name	Function	Remarks	*Page/item No.
CLT1	RGT1-CLT (Aligning roller clutch)	Transmits aligning roller drive.		P7, I4
CLT2	FED1-CLT (Feed roller clutch)	Transmits feed roller drive.		P7, I22
CLT3	PKLP-CLT (Pick-up roller clutch)	Transmits pick-up roller drive.		P7, I22

(3) Counters

Symbol	Code name	Function	Remarks
T	T-CTR (Total counter)	Total counter	6-digit
K	K-CTR (Key-copy counter)	Individual counter	6-digit (option)

(4) Switches

Symbol	Code name	Function	Remarks	*Page/item No.
S1	MAIN-SW (Main switch)	Power supply	Tumbler type	P4, I2
S2	DOOR-SW (Door switch)	For safety, cancels abnormal condition	Push switch	P4, I4
S3	EMP1-SW (Paper-empty switch 1)	Detects lack of paper in the cassette	Reflecting photo sensor	P6, I20
S4	SIZE1-SW (Size switch)	Detects cassette size	Push switch	P6, I26
S5	RGT-SW (Aligning switch)	Detects paper in front of the aligning roller	Photointerruptor	P7, I15
S6	EXIT-SW (Exit switch)	Detects exiting paper	Photointerruptor	P20, I15
S7	HOME-SW (Home switch)	Detects home position of the optical system	Photointerruptor	P12, I16
S8	LNS-SW (Lens switch)	Detects home position of the lens unit	Photointerruptor	P12, I16
S9	MRR-SW (Mirror switch)	Detects home position of the mirror unit	Photointerruptor	P8, I27
S10	T-FUL-SW (Toner-full switch)	Detects when the used toner bag is full	Microswitch	P17, I22

(5) Heaters and lamps

Symbol	Code name	Function	Remarks	*Page/item No.
EXP	EXPO-LAMP (Exposure lamp)	Expose the original	Halogen lamp 300W	P10, I14
HTR	HTR-LAMP (Heater lamp)	Fixing	Halogen lamp 900W	P19, I6
ERS	ERS-LAMP (Discharge lamp)	Discharges the drum	LED type	P15, I14
DCH	DCH-LED (LED eraser array)	To interrupt the charge	LED	P15, I15
DHU	D-HTR-U (Damp heater U)	Keeps optical system warm (option)	PTC	P12, I33
DHL	D-HTR-L (Damp heater L)	Keeps the drum and transfer/ separationcharger case warm (option)	PTC	P6, I36

[Go to 1550 DC Harness Connection Diagram](#)[Go to 1560 DC Harness Connection Diagram](#)

(6) PC boards

Symbol	Code name	Function	Remarks	*Page/item No.
LGC	PWA-F-LGC (Logic PC board)	Controls the entire copier		P5, I14
ACC	PS-ACC (Power supply PC board)	Supplies electrical power to ICs, solenoids and motors		P5, I19
PNL	PWA-F-PNL (Control panel PC board)	Controls condition displays and operation keys		P2, I22
LRG	PS-LRG (Lamp regulator PC board)	Controls exposure lamp		P4, I35
DCH	ASM-DCH (LED eraser array PC board)	Turns on and drives LED during reduction		P15, I15
ERS	ASM-ERS (Discharge lamp PC board)	Discharge lamp		P15, I14
AES	PWA-F-AES	Reads dark/light of the original		P8, I28
FUS	PWA-F-FUS (Fuse PC board)	Fuse for the damp heater circuit.	Option	P5, I23

(7) Transformers

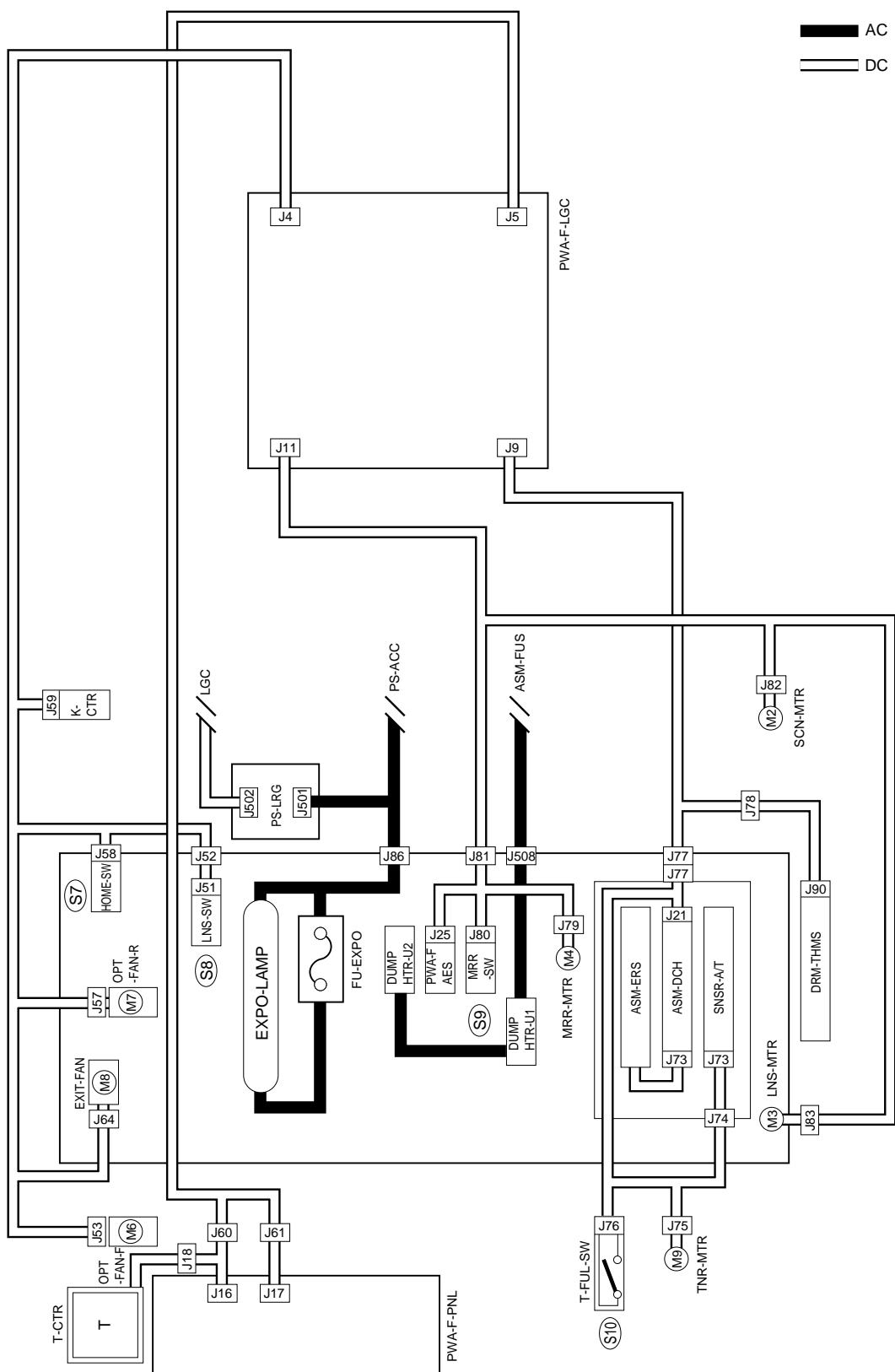
Symbol	Code name	Function	Remarks	*Page/item No.
HVT	PS-HVT (Charging transformer) (Transfer/separation transformer)	Generates high voltage electricity for charging (negative voltage) Generates high voltage electricity for transfer/ separation and developing bias voltage		P5, I18

(8) Others

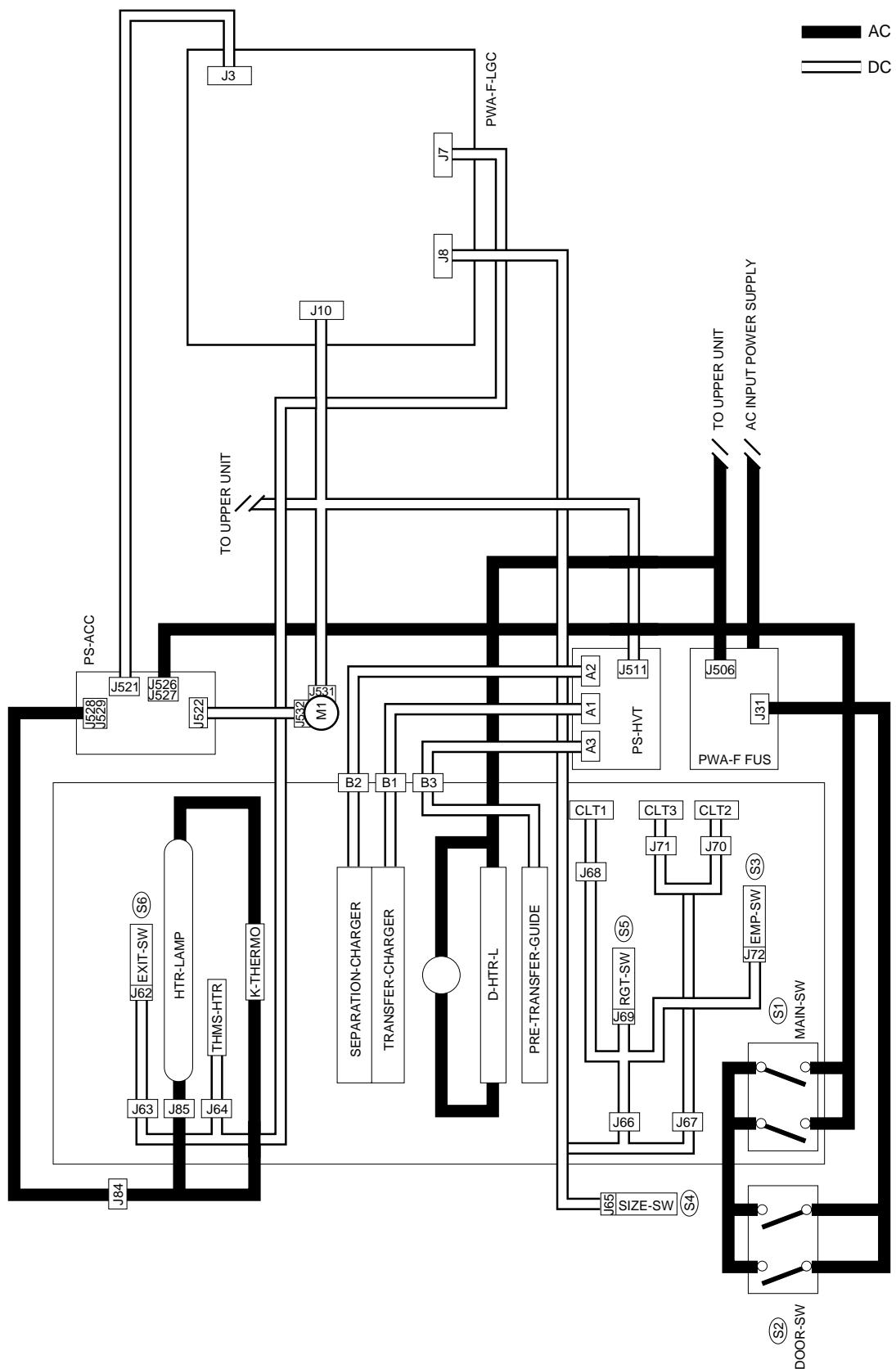
Symbol	Code name	Function	Remarks	*Page/item No.
ATS	SNR-ATC (Auto-toner sensor)	Reads toner density with a magnetic sensor		P18, I26
THMS	THMS-HTR (Heat-roller thermistor)	Detects temperature of the heat roller		P20, I9
THERMO	K-THERMO (Thermostat)	Prevents abnormal heating of heat roller		P20, I8
FU	FU-EXPO (Thermofuse)	Prevents abnormal heating of the exposure lamp		P10, I5
TMS-DRM	TMS-DRM (Drum thermistor)	Detects the drum temperature roughly		P3, I39

2.3 Wire-Harness Location Diagram

A. Location Diagram for Upper Unit



B. Location Diagram for Lower Unit

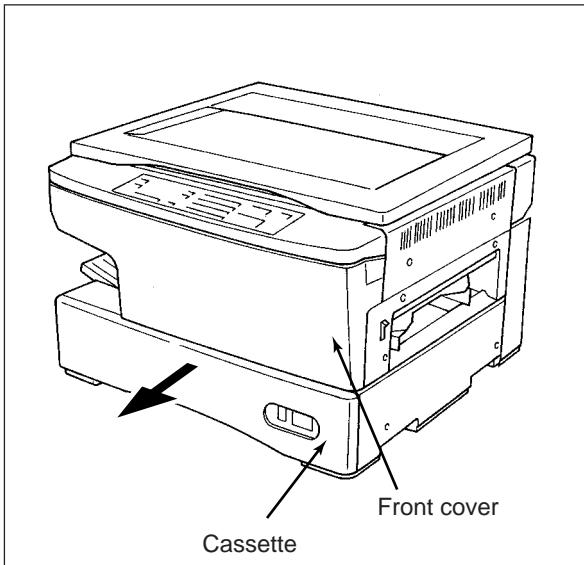


2.4 Removing Covers and Electrical Parts

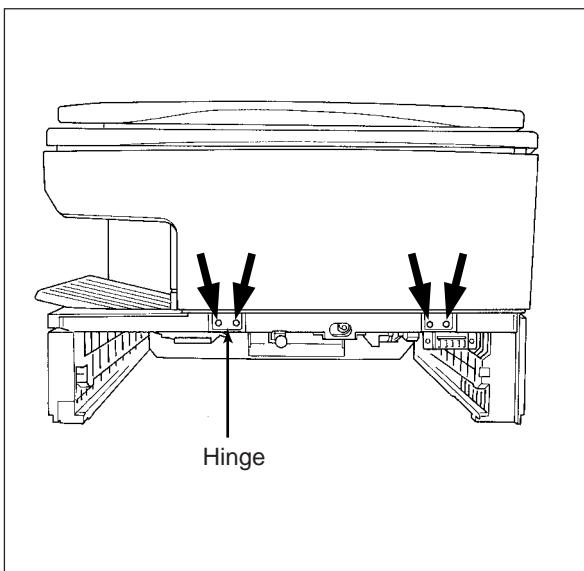
2.4.1 Removing covers

[A] Front cover

- (1) Remove the cassette (in the direction of the arrow).

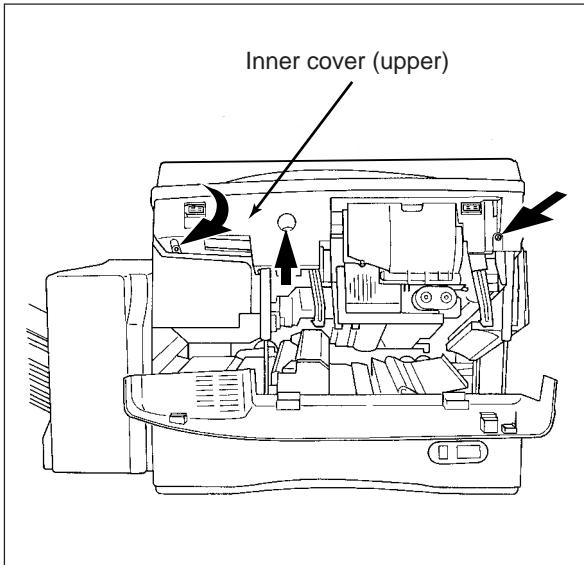


- (2) Remove the screws fastening the hinge (4 pcs.).



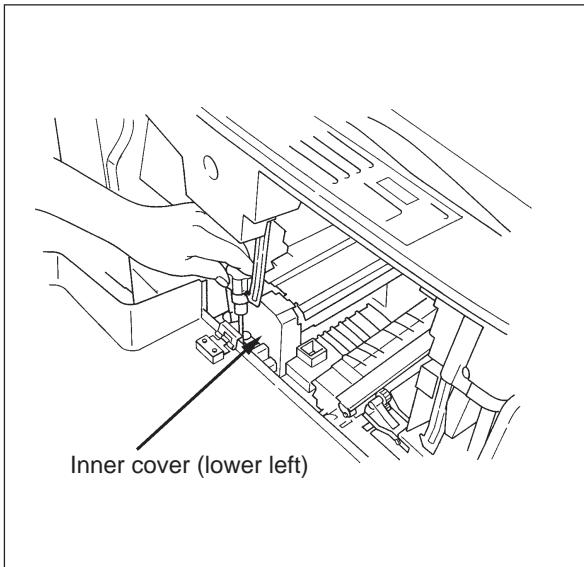
[B] Inner cover (upper)

- (1) Open the front cover.
- (2) Remove the toner cartridge.
- (3) Remove three screws.



[C] Inner cover (lower left)

- (1) Remove one screw.



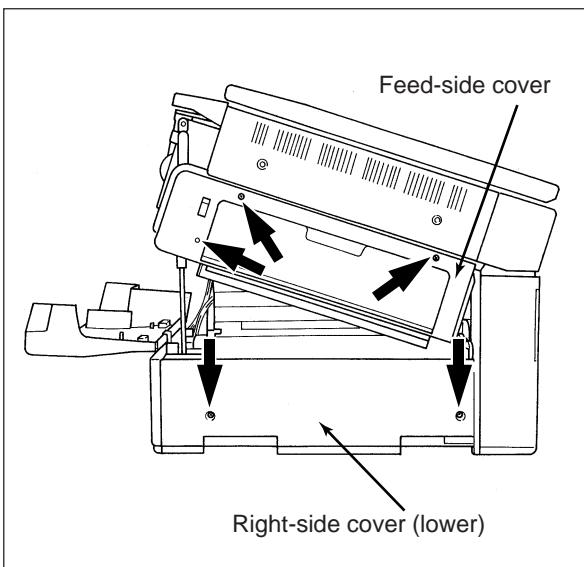
[D] Right-side covers (upper and lower) and feed-side cover

Feed-side cover

- Open the front cover.
- Raise the upper unit.
- Remove three screws.

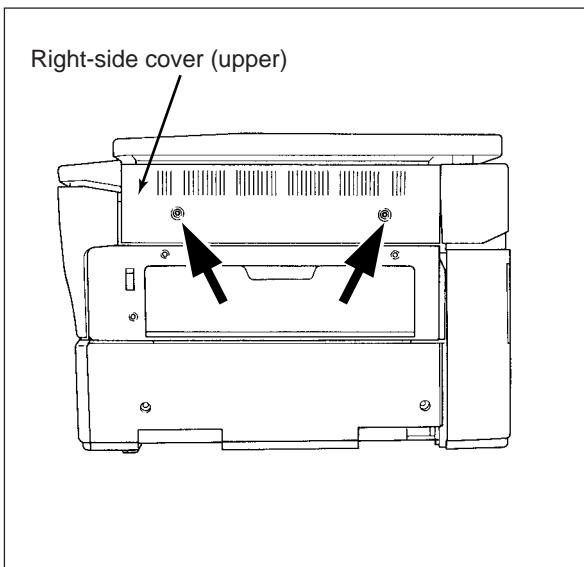
Right side cover (lower)

- Open the front cover.
- Raise the upper unit.
- Remove two screws.



Right-side cover (upper)

- Remove two screws.
- Remove the glass holder (see 2.4.1).



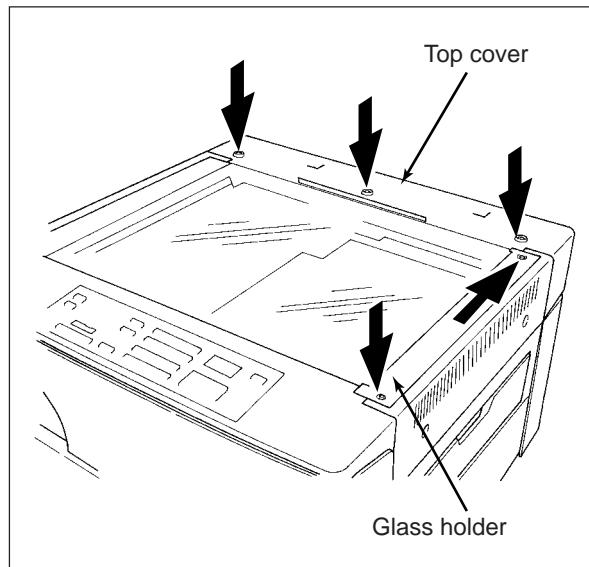
[E] Top cover and glass holder

Glass holder

- Open the original cover.
- Remove two screws.

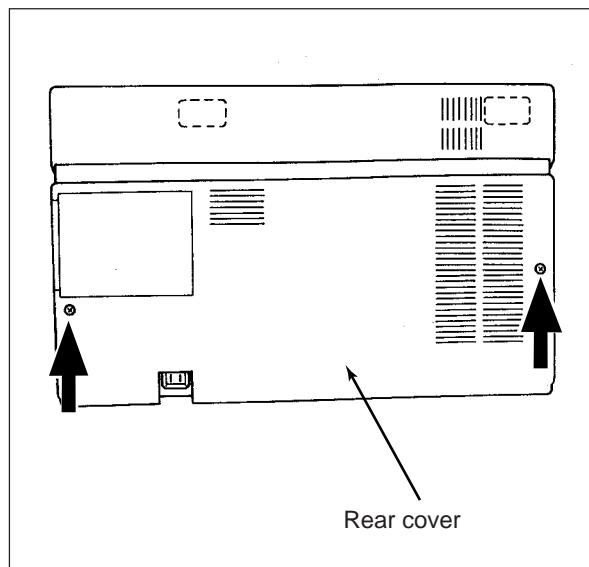
Top cover

- Remove the original cover.
- Remove three screws.



[F] Rear cover

- Remove two screws.



[G] Left-top cover, left-side cover (upper) and left-side cover (lower)

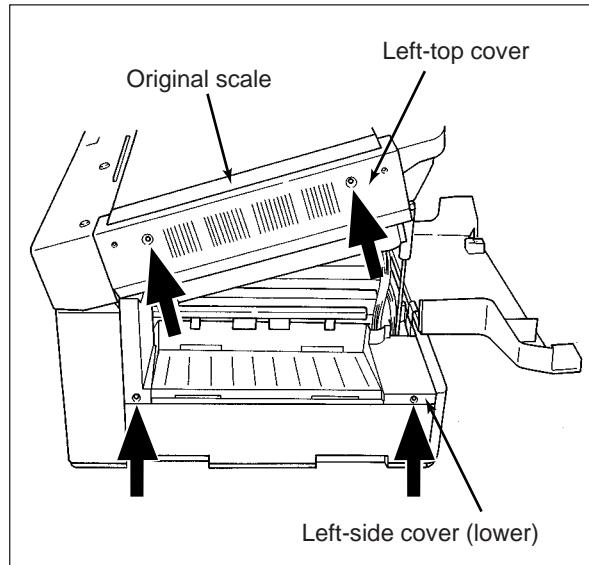
(1) Raise the upper unit.

Left-top cover

- Remove the original scale. (Two screws)
- Remove two screws.

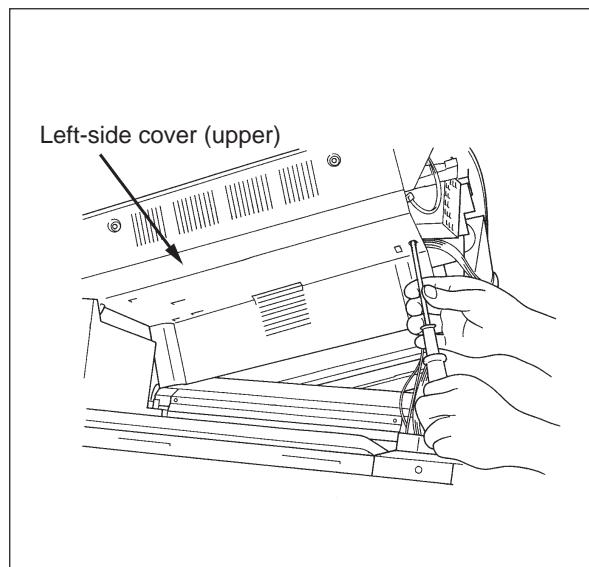
Left-side cover (lower)

- Remove two screws.



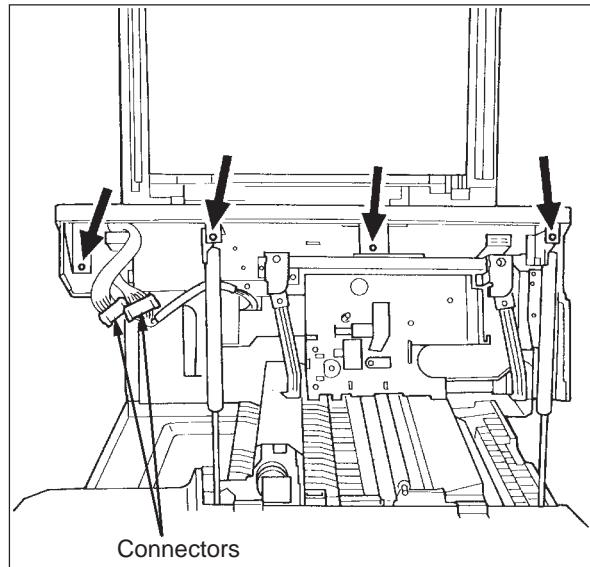
Left-side cover (upper)

- Remove one screw.



[H] Control panel cover

- (1) Raise the upper unit and remove the inner cover (upper).
- (2) Disconnect two connectors and remove four screws.



2.4.2 Removal and installation of electrical parts

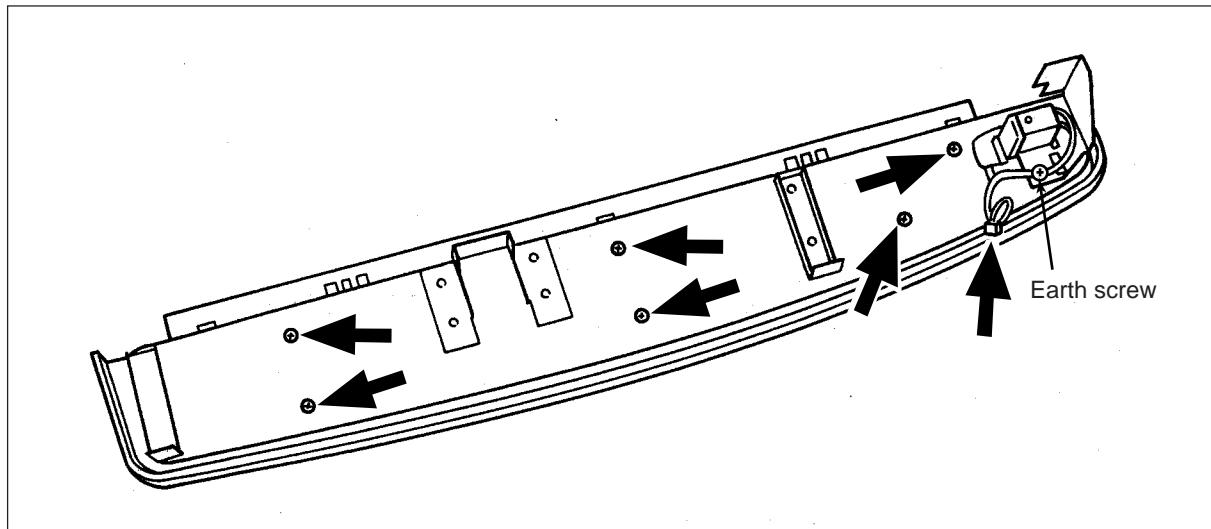
[A] Remove the control-panel (PWA-F-PNL) PC board

- (1) Remove the control panel cover.

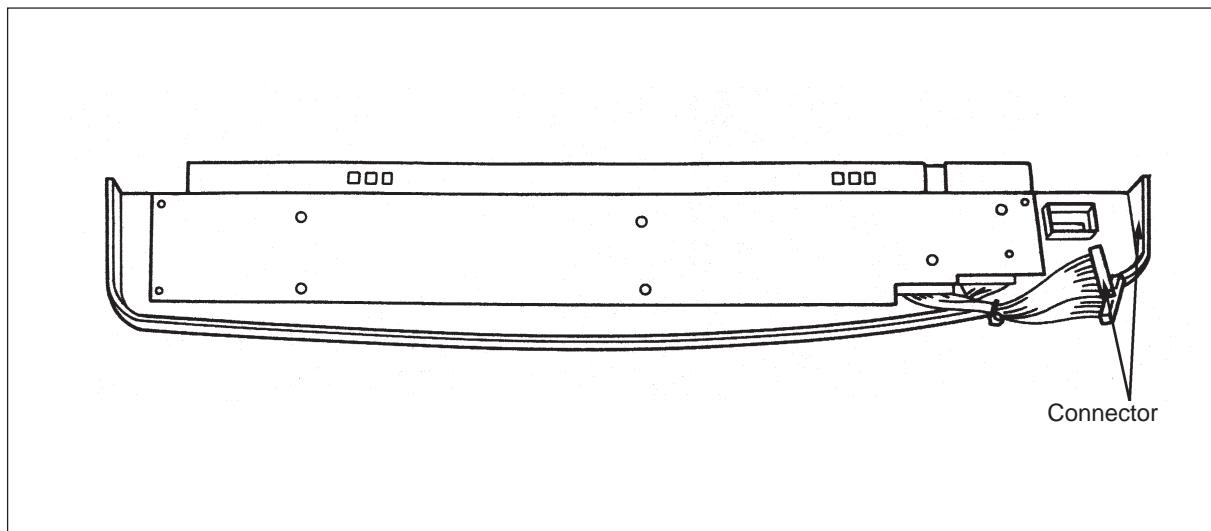
Refer to 2.4.1 [H].

- (2) Place the control panel cover upside down and remove its metal cover (6 screws).

Remove the earth screw of the shield. Remove the counter connector.



- (3) When you remove nine (9) screws, the control-panel PC board can be taken out along with the harness. They can be separated if you disconnect two connectors.

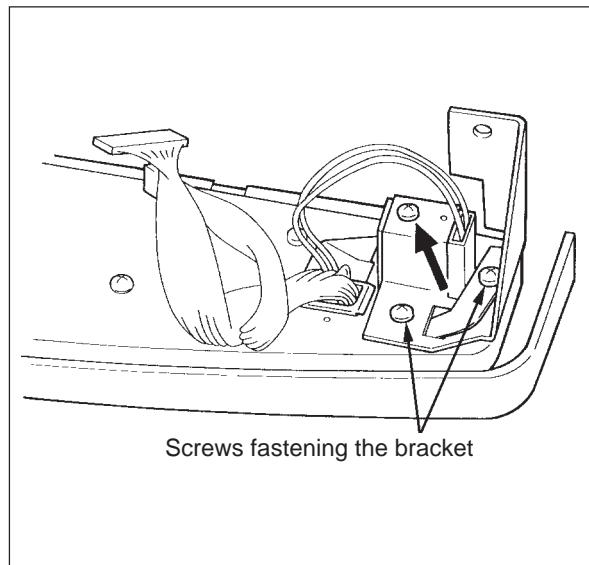


Note: Be careful not to allow the ground wire of the shield to be cut.

[B] Total counter

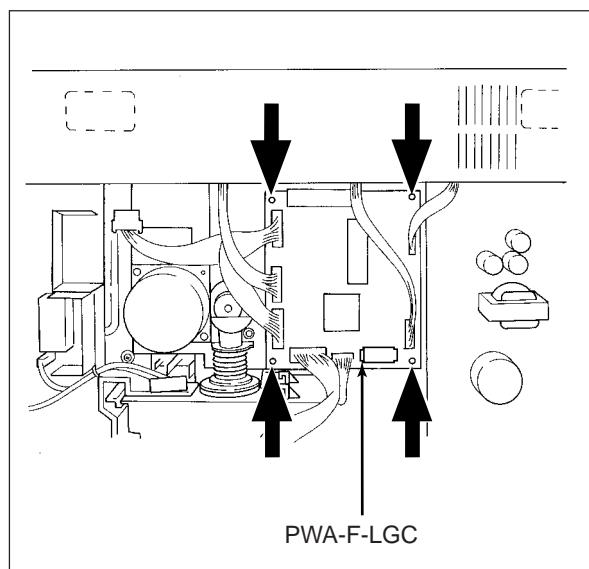
- (1) Remove the control panel cover.
- (2) Place the control panel cover upside down and remove the two screws fastening the bracket.
- (3) Remove one screw.
- (4) Disconnect one connector.

Note: Be careful not to allow the ground wire of the shield to be cut.



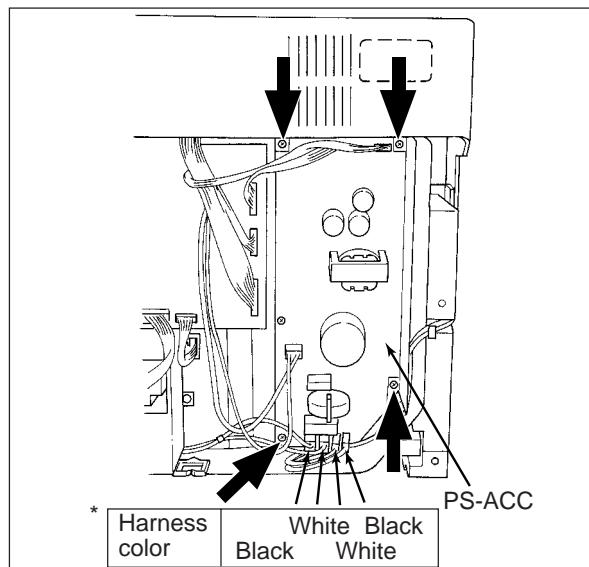
[C] Logic PC board (PWA-F-LGC)

- (1) Remove the rear cover.
- (2) Disconnect connectors (10 pcs. when no optional equipment is used and 11 pcs. when optional equipment are used) and take out the PC board from its four lock supports.



[D] Power supply unit

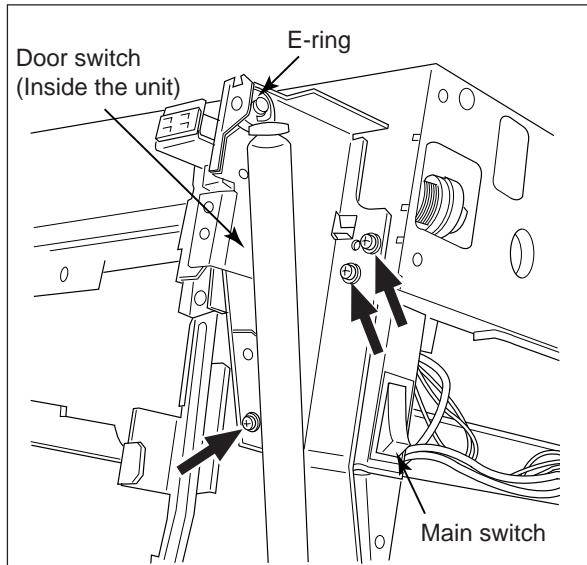
- (1) Remove the rear cover.
- (2) Disconnect connectors (9 pcs.).
- (3) Remove four screws.
* About bottom 4 connectors, black harness must be connected "L" terminal that is described on PC board and white must be "N".



[E] Door switch and Main switch (power switch)

[E-1] 1550

- (1) Remove the inner cover.
- (2) Remove the feed-side cover.
- (3) Remove the right side cover (upper).
- (4) Snap off an E-ring.
- (5) Take out the gas spring.
- (6) Remove three screws and tilt the unit toward you after having shifted it toward the right.
- (7) Removing the respective connectors and screws allows the door switch and the main switch to be removed and replaced. Before replacement, pay attention to the colors of the connectors and the harnesses.



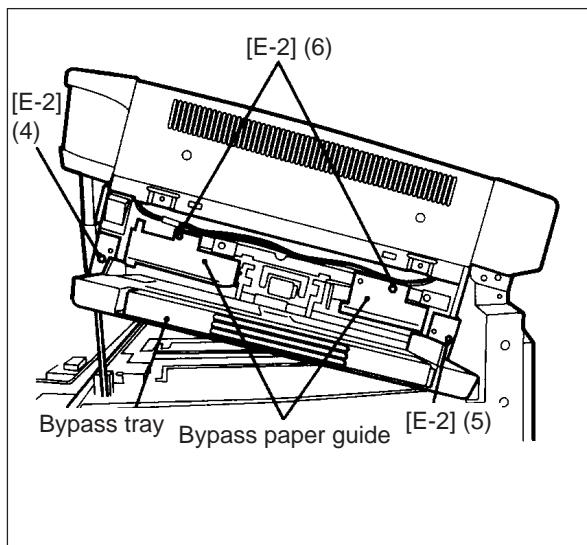
Main switch Door switch

Connector	Yellow	Blue	Blue	Yellow
Harness	White	White	Black	Black

Connector	Blue	Blue	White	White
Harness	Black	White	Black	White

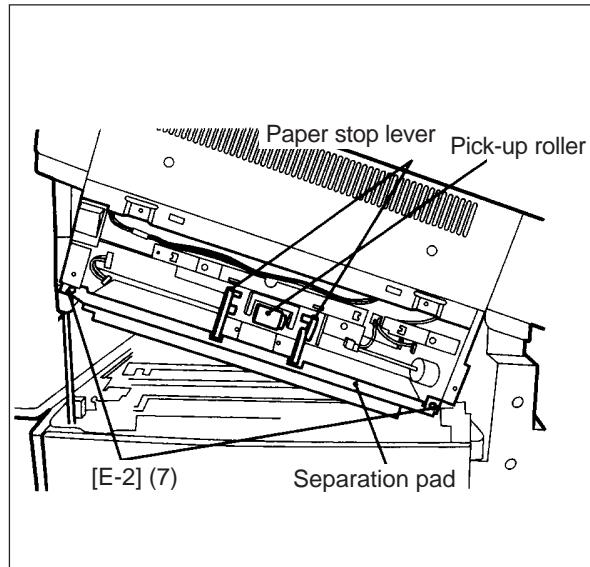
[E-2] 1560

- (1) Remove the rear cover.
- (2) Open the front cover and raise the upper unit.
- (3) Remove the bypass paper-feed cover (2 screws).
- (4) Remove the front support bracket (1 screw) of the bypass and take out the bypass tray.
- (5) Remove the rear support bracket (1 screw).
- (6) Remove the bypass paper guides (upper/2 pieces) (1 screw each).

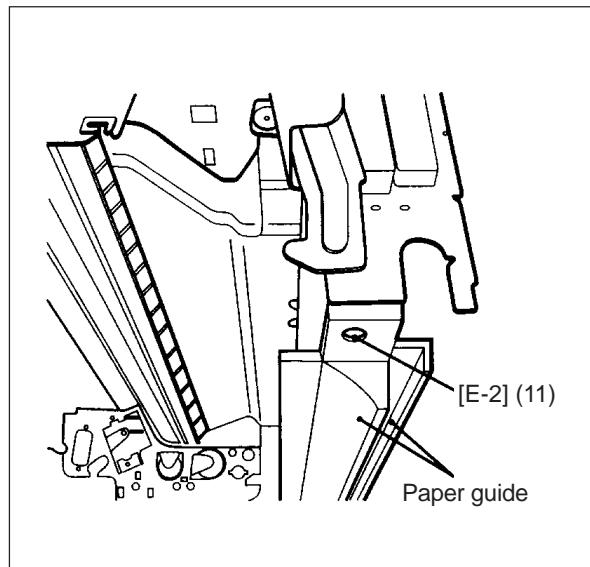


- (7) Remove the 2 screws of the bypass separation pad bracket.
- (8) Push down the pick-up roller and take out the separation pad bracket by pushing down the paper stop lever and the arm of the paper sensor.

For the removal of the bypass paper feed roller, the separation pad and the clutch, details are given later.

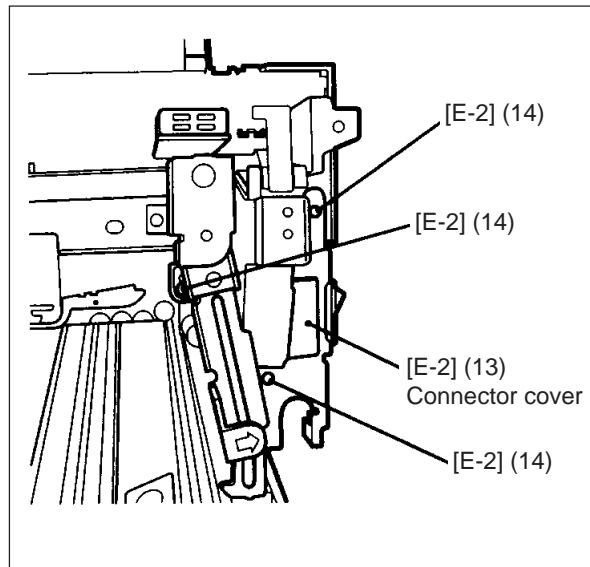


- (9) Remove the process unit, inner cover (upper) and the control panel.
- (10) Remove the paper-feed side gas spring (E-ring, 1 piece). Then, open the original cover to prevent the upper unit from falling down.
- (11) Remove 1 screw of the paper guide and pull it out toward the front. (two paper guides can be removed at the same time.)
- (12) Remove the right cover.
- (13) Remove the connector cover of the switch.



- (14) Remove the 3 screws of the bracket fixing the switch.
- (15) Pull the bracket out with the harness connected.

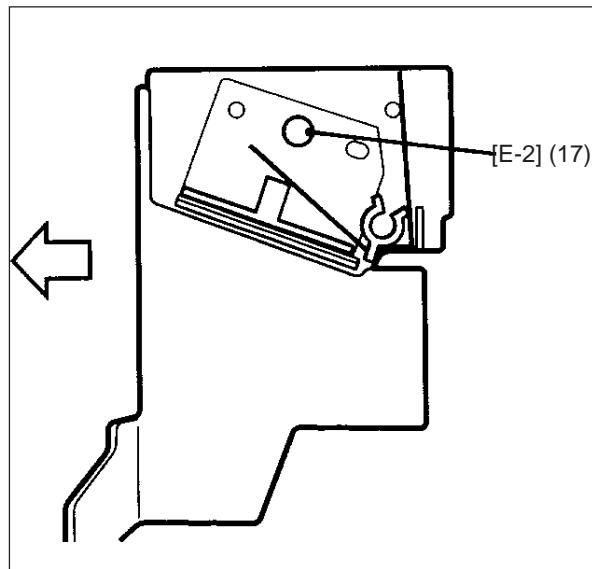
< For removing the lens motor, details are given later. >



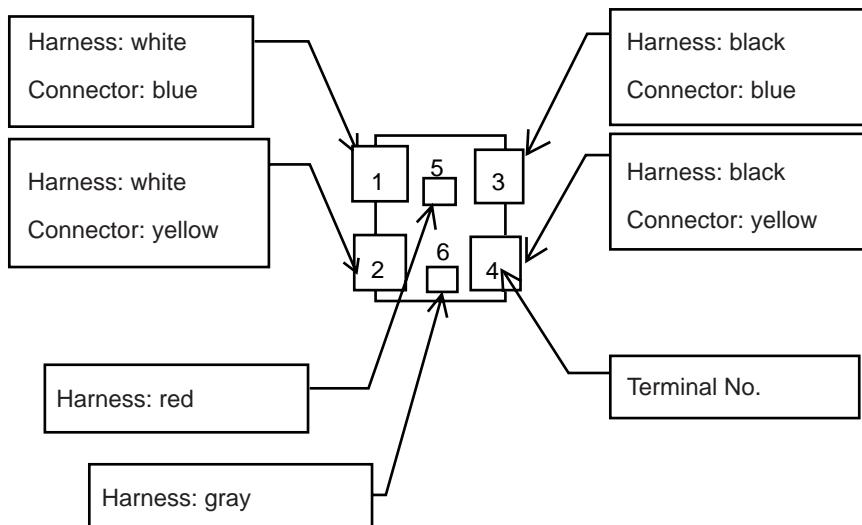
(16) Take out the main switch connector and remove the switch while pushing the switch pawl.

(17) Take out the door switch bracket (1 screw) and remove the bracket in the direction of the arrow.

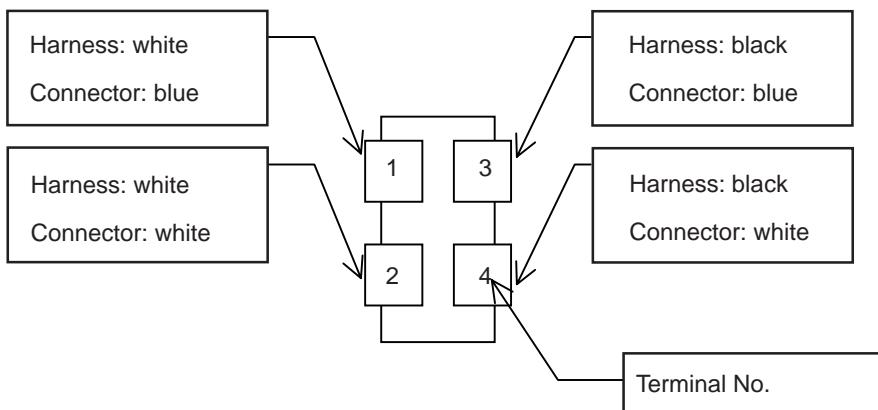
(18) Take out the switch connector and remove the switch while pushing the switch pawl. When reassembling, take care with the contacting of the connector.



Main switch connector connecting diagram.

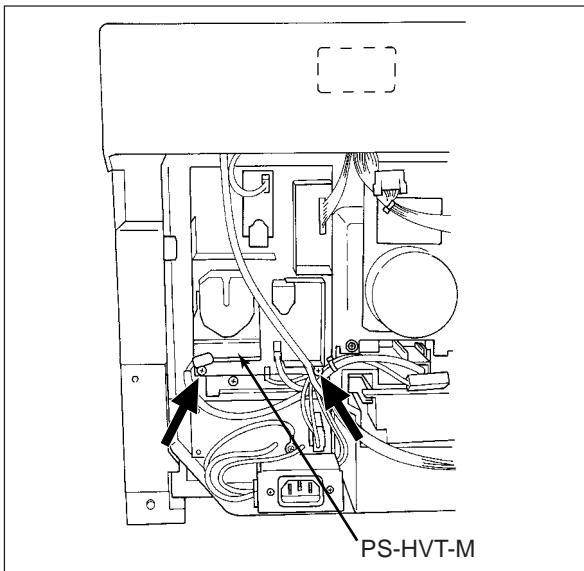


Door switch connector connecting diagram.



[F] High-voltage transformer for the main charger (PS-HVT-M)

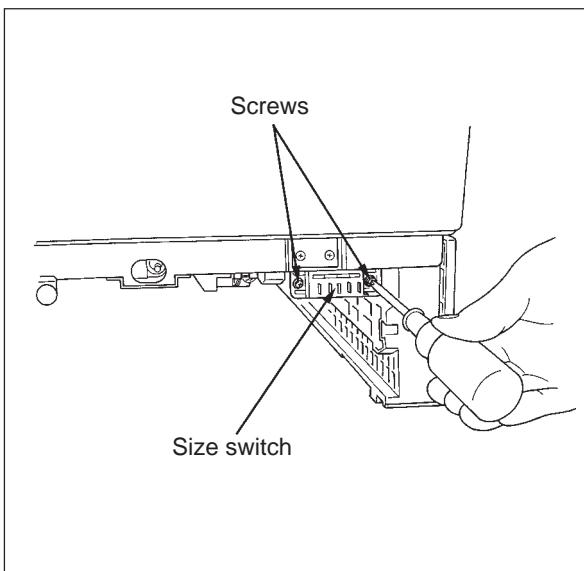
- (1) Remove the rear cover.
- (2) Disconnect seven (7) connectors.
- (3) Remove two screws.
- (4) Remove two lock supports.



[G] Size switch

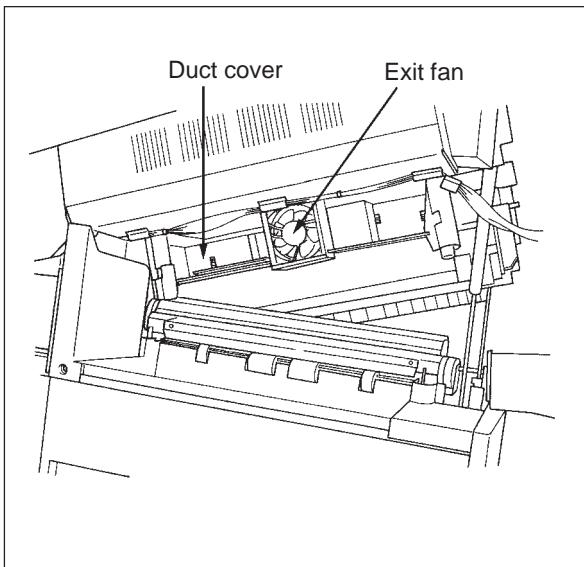
- (1) Pull out the cassette.
- (2) Remove two screws.
- (3) Disconnect one connector.

Note: The left screw is tightened with the protective cover on the corner of the switch.



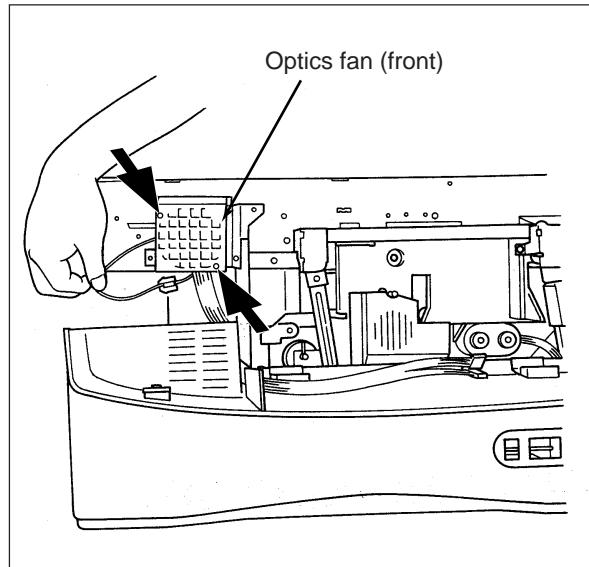
[H] Exit fan

- (1) Remove the left-side cover (upper) (1 screw).
- (2) Disconnect three connectors (front).
- (3) Remove the duct cover (1 screw).
- (4) Separate the exit fan from the cover (1 connector).



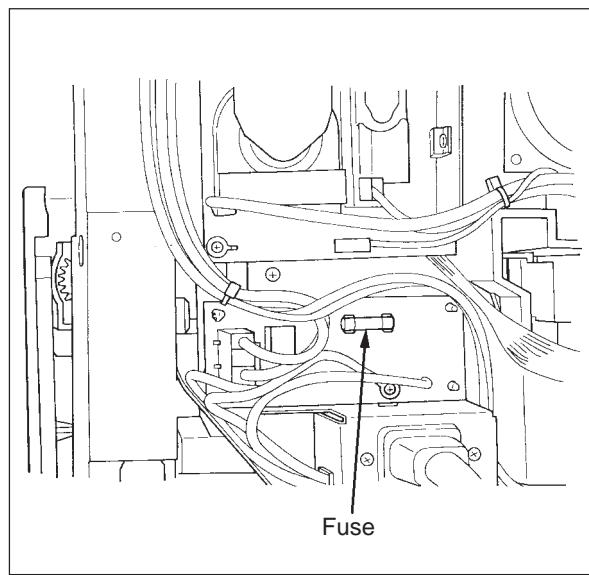
[I] Front optics fan (front)

- (1) Remove the inner cover.
- (2) Disconnect one connector.
- (3) Remove two screws.



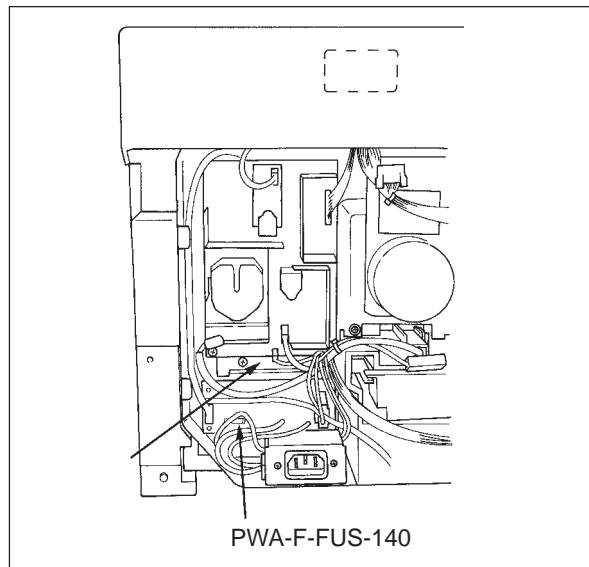
[J] Fuse (PWA-F-FUS-140)

- (1) Remove the rear cover.
- (2) Replace the fuse.



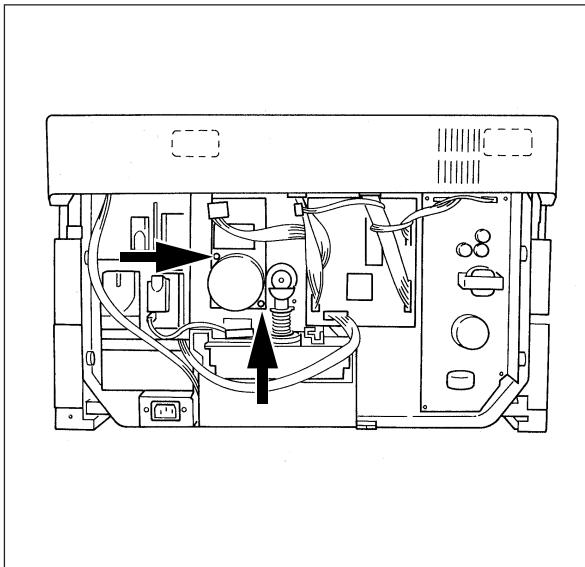
[K] Fuse PC board (PWA-F-FUS-140)

- (1) Disconnect one connector.
- (2) Remove one screw.
- (3) Remove the fuse PC board with the bracket.



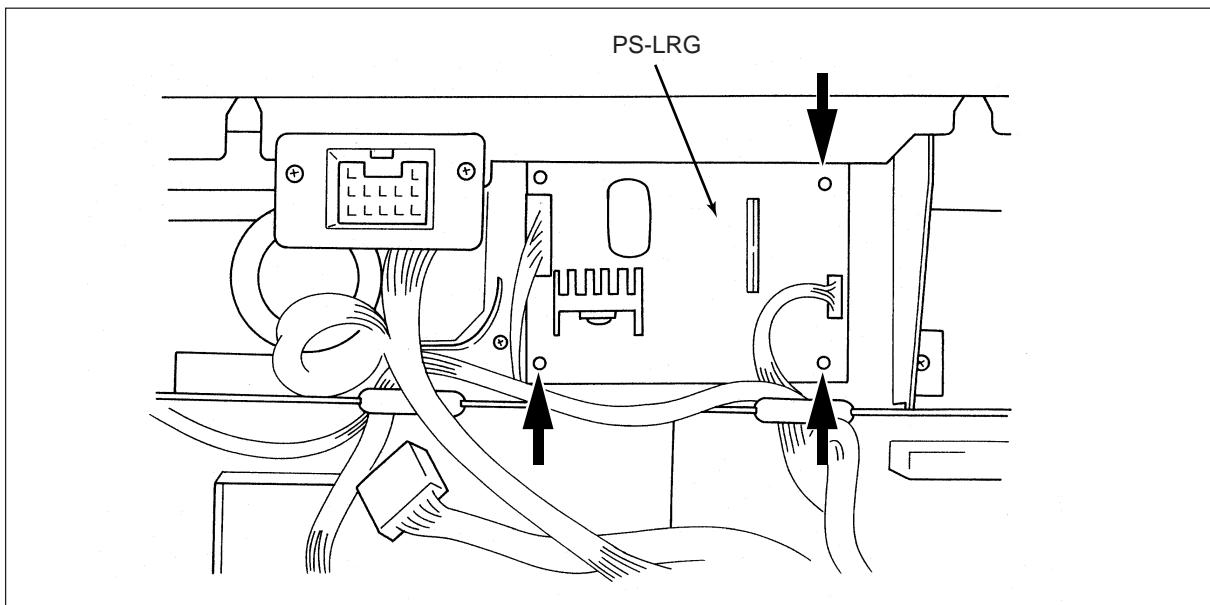
[L] Main motor

- (1) Disconnect two connectors.
- (2) Remove two screws.



[M] Lamp regulator PC board (PS-LRG)

- (1) Remove the top cover.
- (2) Disconnect two connectors and remove the PC board from three lock supports.



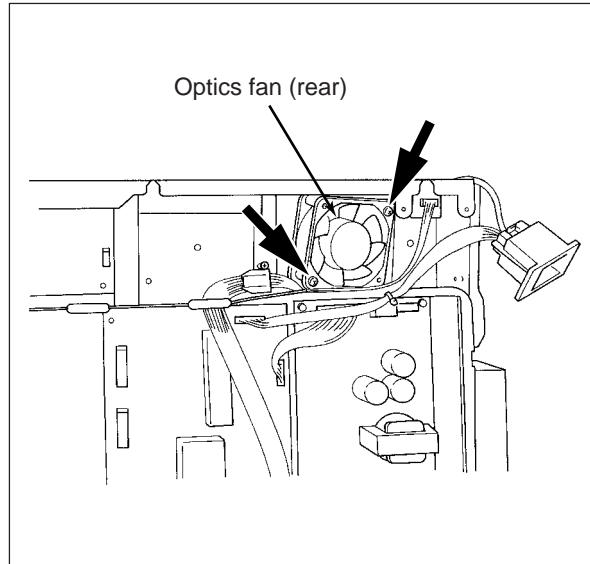
[N] Optics fan (rear)

(1) Remove the top cover.

Remove the connector from the sorter (two screws).

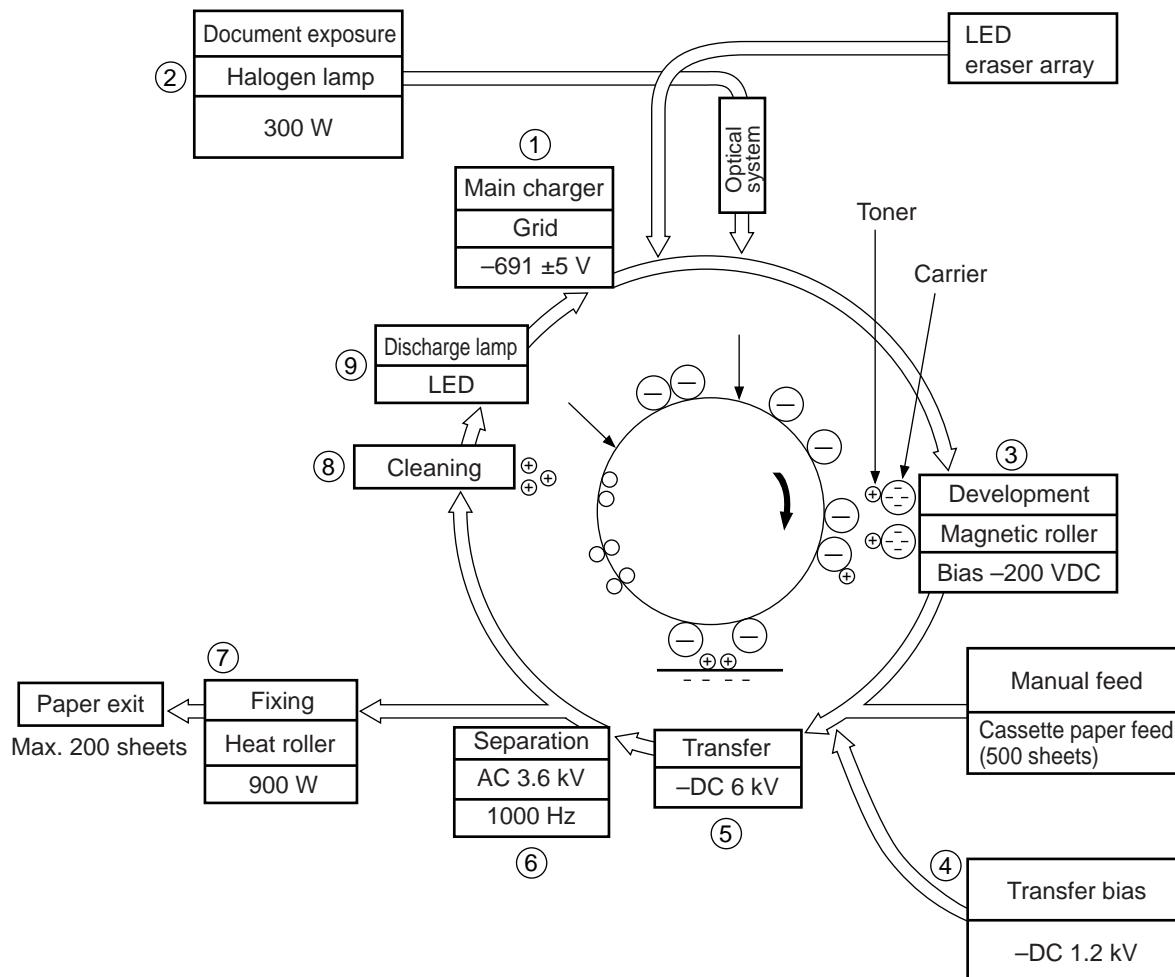
(2) Disconnect one connector.

(3) Remove two screws.



3. COPYING PROCESS

3.1 Copying Process



① Main charger : A negative electrostatic charge is placed on the photoconductive (photosensitive) surface of the drum.	⑥ Separation : The copy paper is separated from the surface of the drum together with the toner image.
② Exposure : Forms an electrostatic latent image on the photoconductive surface of the drum.	⑦ Fixing : The toner image is fixed to the copy paper by heat and pressure.
③ Development : Positively charged toner is attracted to the photoconductive surface of the drum to form a visible image.	⑧ Cleaning : Any toner remaining on the photoconductive surface of the drum is mechanically removed by the cleaning blade.
④ Transfer bias : Raises transfer efficiency.	⑨ Discharging : Erases the electrostatic charge remaining on the photoconductive surface of the drum.
⑤ Transfer : Transfers the visible toner image from the surface of the drum to the copy paper.	

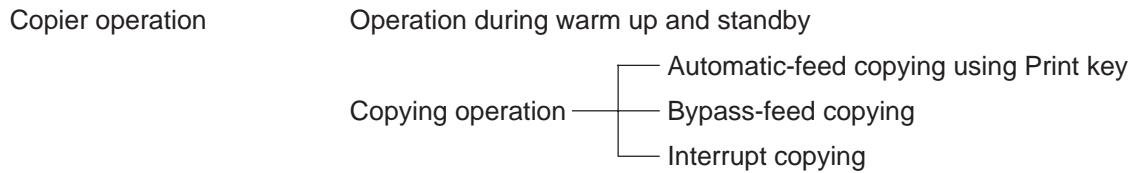
3.2 ED-1550/1560 Copying Process

Process	1550/1560
1. Drum	OD-1550 (OPC ø60)
(1) Sensitivity	Highly sensitized drum
(2) Surface potential	DC-700V Scolotron system
2. Charging	Variable output
3. Exposure	
(1) Light control	Automatic exposure/manual step setting
(2) Light source	300W halogen lamp stabilized with regulator (light intensity remains constant even when voltage varies)
4. Development	
(1) Magnetic roller	One magnetic roller (with two shaft mixers)
(2) Auto-toner	Magnetic bridge-circuit system
(3) Toner replenishment	Toner cartridge system
(4) Toner-empty sensor	Intensity sensing system
(5) Toner	T-1550 or T-1550E
(6) Developing material	D-1550
(7) Developer bias	DC-200V
5. Transfer	Adjustable output (fixed current)
6. Separation	Adjustable output (independently adjustable)
7. Discharge	
(1) Discharging position	After cleaning
(2) Discharge lamp	LED type
8. Cleaning	
(1) System	Blade system
(2) Recovery of toner	Non-reusable

Process	1550/1560
9. Fixing	
(1) Type	Heat roller system
• Fixing	• Fixing roller: Teflon coated roller
• Pressure	• Pressure roller: PFA tube silicon roller (ø28)
• Lamp rating	• 900W (infrared heat)
(2) Cleaning	Cleaning with silicon impregnated roller
(3) Heater temperature control	ON/OFF control by thermistor
10. Control	Microcomputer

4. COPIER OPERATION

4.1 Operation Outline



4.2 Description of Operation

4.2.1 During warm up

(1) Copy quantity indicator shows "0" and print-key lights up "red" lamp.

Heater lamp comes ON.

Initial position setting for the optical system ~ moves the lens and the mirror to actual-size position.

Exit fan (M8) stops and optical fans (M6/M7) stop.

(2) When the heat-roller temperature is sufficient for fixing:

The heater lamp goes OFF.

The copy quantity indicator shows "1", and the print key changes to "green" lamp.

(Paper jam release cover to be closed when there is paper in the cassette.)

Exit fan (M8) starts rotating at low speed and optical fans (M6/M7) stop.

4.2.2 Standby (ready) condition

All keys on the control panel are operable.

When there is no other key entry for a predetermined period, the machine is set automatically to a copy quantity of "1", a reproduction ratio of 100% and automatic exposure.

4.2.3 Cassette feed copying using the print key

(1) Print key ON

Print key display changes from "green" to "red".

Main charger, transfer charger, separation charger, transfer bias, discharge lamp and LED eraser array come ON and optical fans (M6/M7) rotate at high speed. Exit fan (M8) starts rotating at high speed.

Main motor (M1) comes ON.

~ Drum, developer, heat roller and paper-exit roller rotate.

(2) Paper feeding from cassette

The feed roller clutch (CLT2) and the pick-up roller clutch (CLT3) come ON.

~ The pick-up roller and paper feed roller rotate.

After a pre-defined period the pick-up roller clutch (CLT3) goes OFF.

Aligning operation

Paper arrives at the aligning roller.

~ Aligning switch (S5) ON

After a pre-defined period feed roller clutch (CLT2) goes OFF.

Paper feeding complete.

(3) Carriage operation

Exposure lamp ON

Carriage 1 and carriage 2 forward operation starts.

~ Scanning motor (M2) ON

At this time, if the toner density of the developer material is lower than the set value, toner replenishment is performed.

~ Toner motor (M9) is turned ON.

(4) When a fixed time has passed since the carriage operation

~ Paper is transported to transfer section, transport is promoted ~ aligning-roller clutch (CLT1) is turned ON, and the copy quantity counted.

(5) Carriage scanning complete

Scanning motor (M2) is turned OFF.

The main charger and the exposure lamp are turned OFF.

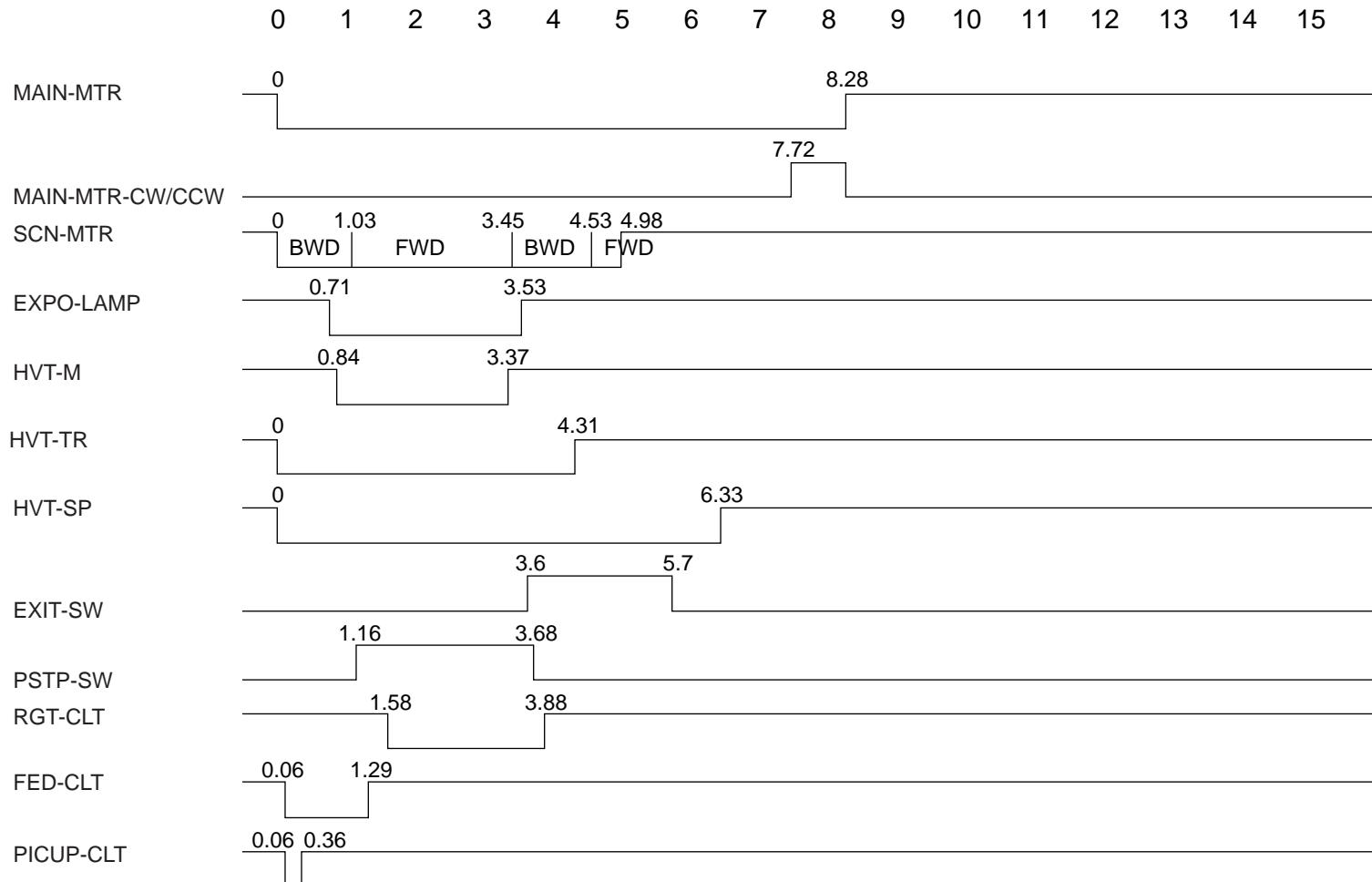
Aligning-roller clutch (CLT1) is turned OFF. (The timing varies according to paper used.)

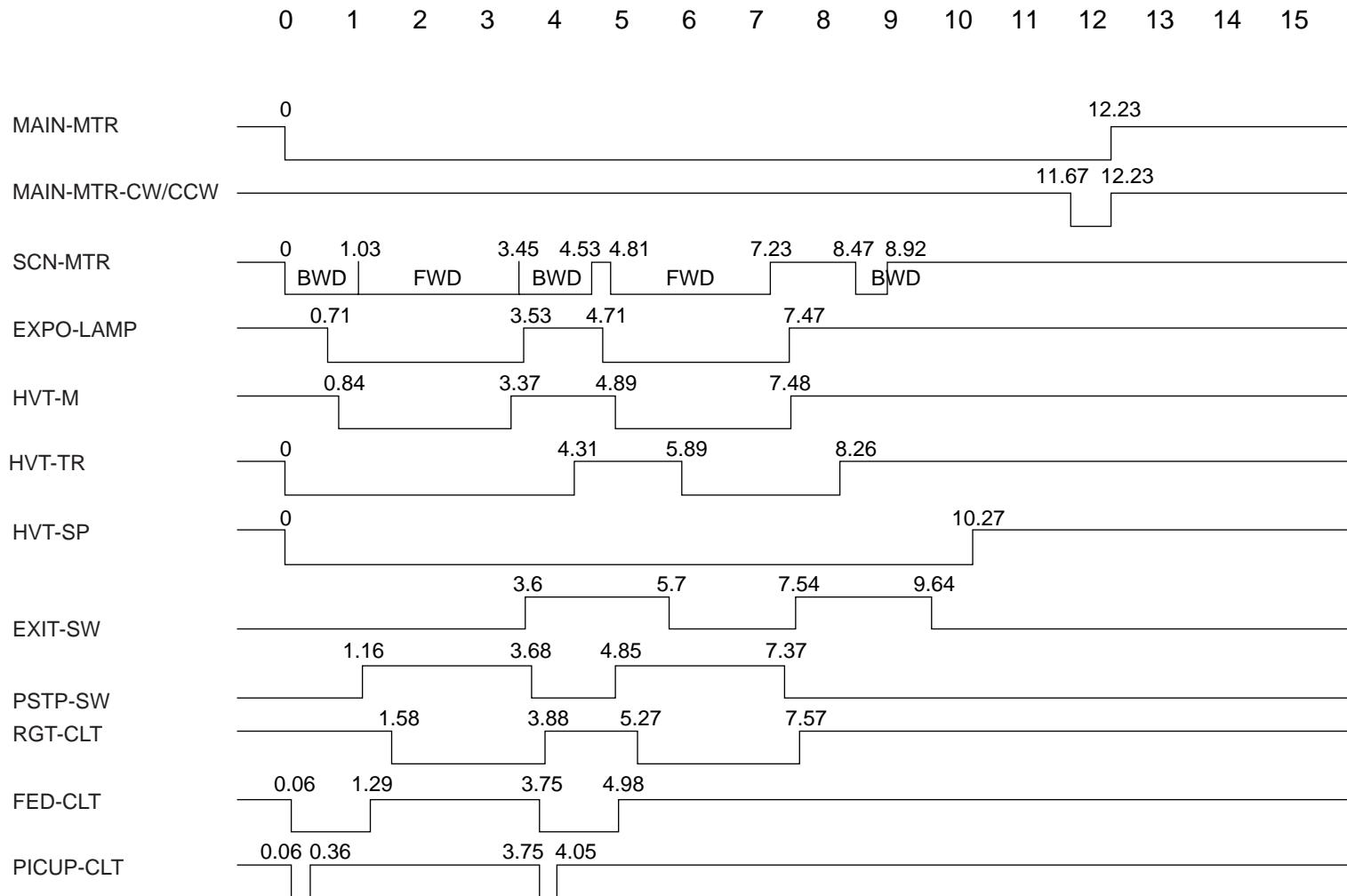
(6) Paper-exit operation

The exit switch (S6) detects the trailing end of the paper passing.

The main motor (M1), transfer charger, separation charger, transfer bias which is turned ON/OFF in accordance with paper feeding, discharge lamp and LED erase array are turned OFF. Optical fans (M6/M7) stop and exit fan (M8) starts rotating at low speed.

Print key: "Green" lamp is turned ON.





4.2.4 Bypass-feed copying

4.2.4.1 1550

(1) Insert paper in bypass feed guide.

Aligning switch (S5) is turned ON.

~ Bypass-feed indicator lights up

Carriage 1 and carriage 2 move to the home position.

(2) Print key ON

Main charger, transfer charger, separation charger, transfer bias, discharge lamp and LED eraser array are turned ON.

Optical fans (M6/M7) and exit fan (M8) start rotating at high speed.

Main motor (M1) ON

~ Drum, developer, heat roller and paper-exit roller rotate.

(3) Subsequently operations for automatic-feed copying (3) ~ (6) are continued by the use of the print key.

4.2.4.2 1560

(1) Insert the paper in the bypass paper-feed slot.

Switch ON the bypass

The bypass LED of the control panel lights up.

(2) Press the PRINT key

The main charger/transfer charger/separation charger/transfer bias/discharge lamp/LED eraser lamp are turned ON/and the optical system fan motor rotates at a high speed.

The main motor comes ON~the drum/developert/heat roller/and paper-exit roller rotate.

(3) Bypass paper-feed operation

The manual feed clutch comes ON~the bypass pick-up roller/paper feed roller rotate.

Aligning operation (the paper reaches the aligning roller)~switch is turned on paper stop.

After a fixed time, the manual feed clutch goes OFF~ paper-feeding is finished.

(4) Thereafter, the paper-feeding operation is the same as with the cassette.

4.2.5 Interrupt copying

(1) Press interrupt key.

Interrupt lamp comes ON.

The copier temporarily interrupts the copying operation, and carriage 1 and carriage 2 return to their fixed position.

Automatic exposure goes into the reproduction ratio 100% copy mode. The copy quantity indicator remains unchanged.

(2) Select desired copying conditions (single-sheet copying only is possible).

(3) After interrupted mode copying has finished.

Press the interrupt key, then the interrupt lamp goes OFF and the conditions prior to interruption are resumed.

(4) Press print key.

Copying operations prior to interruption are resumed.

4.3 Fault Detection

If a fault occurs in the copier, a symbol corresponding to the type of fault will be displayed in order to draw the attention of the operator.

- Classification of faults

A) Faults which can be cleared without turning OFF the door switch (S2)(yellow flashing display on the display panel).

(1) Add paper

(2) Insert key-copy counter

(3) Replace toner bag (This is cleared by replacing the toner bag) (red flashing display)

B) Faults which can not be cleared without turning OFF the door switch (S2) (no display provided on the display panel).

(1) Clear paper

(2) Add toner (yellow flashing display)

C) Faults which can not be cleared without turning OFF the main switch (S1).

(1) Service call

A-1) Add paper ()

- When cassette is inserted in the machine, the paper-empty switch (S3) or (S16) detects the existence of paper ~ When there is no paper, the switch goes OFF.
- When cassette is not inserted in the machine, the paper size switch (S4) or (S18) detects the non-existence of cassettes ~ The paper-size switches all go OFF.



When cassette is not inserted in the machine
When cassette is inserted in the machine but there is no paper.



No-paper state



Signal is sent to control circuit.



"Add Paper" display will flash. 



* Print key will be inoperable.

- * Bypass-feed copying is possible if there is paper on the manual feed guide, even when there is no paper in the cassette.

A-2) Bypass misfeed

- During sheet bypass copying

Manual-feed roller clutch (CLT4) goes ON.

↓

Aligning switch (S5) comes ON.

If the aligning switch goes OFF when the aligning-roller starts rotating.

↓

Bypass misfeed

↓

The bypass misfeed symbol is displayed. (8ʌ)

↓

Copying cannot be started.

A-3) Insert key-copy counter.

- If the key-copy counter (option) has been inserted in the machine and is withdrawn, "Insert Key Counter" is displayed.

Copying can not be started.

- If the key counter is withdrawn during copying, the machine will stop after the paper being copied has exited.

B-1) Clear paper (8Λ)

- The leading-edge jam is detected by the exit switch (S6): (E01)

The aligning roller clutch (CLT1) is turned ON.

↓ 2.0 sec*

The exit switch (S6) comes ON.

- * When S6 has not come ON after 2.5 seconds have elapsed.

↓

The "Clear Paper" (E01) symbol appears and copying will stop.

- The trailing-edge jam is detected by the exit switch (S6) : (E02). Aligning roller clutch (CLT1) is turned OFF.

↓ 2.0 sec*

S6 OFF (detects paper)

- * When S6 has not come OFF after 2.5 seconds have elapsed.

↓

The "Clear Paper" symbol (E02) appears and copying stops.

- Immediately after the power is turned ON.

↓

The aligning switch (S5) and exit switch (S6) detect the paper (ON).

↓

"Clear Paper" symbol (E03)

- The front cover is opened during copying.

↓

"Clear Paper" symbol (no indication)

B-2) Add toner (▲)

Toner density has become low.

↓

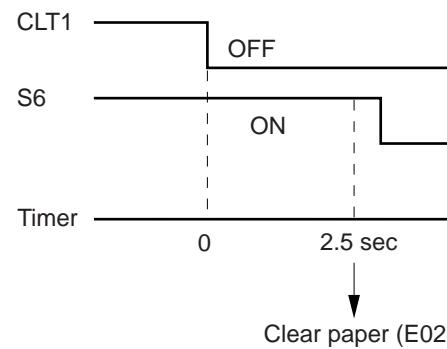
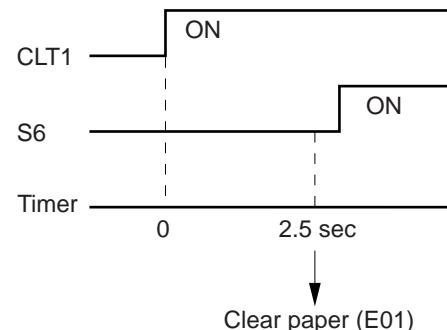
Toner empty signal detection: Auto-toner sensor

↓

Control circuit: "Add Toner" symbol appears: Copying is not possible.

Clearing method: Replace toner cartridge and close front cover.

Toner supply operation (toner density is resumed at the proper level): Copying is possible.



B-3) Replace toner bag (█)

The toner bag becomes full of toner.

↓

The toner-recovery auger moves towards the front of the machine: Toner-full switch (S10) will be turned ON.

↓

"Replace Toner Bag" symbol is displayed.

- When the toner-full switch (S10) comes ON during copying.

↓

Copying will stop after the last sheet has been exited during copying.

Clearing method: Replace with a new toner bag.

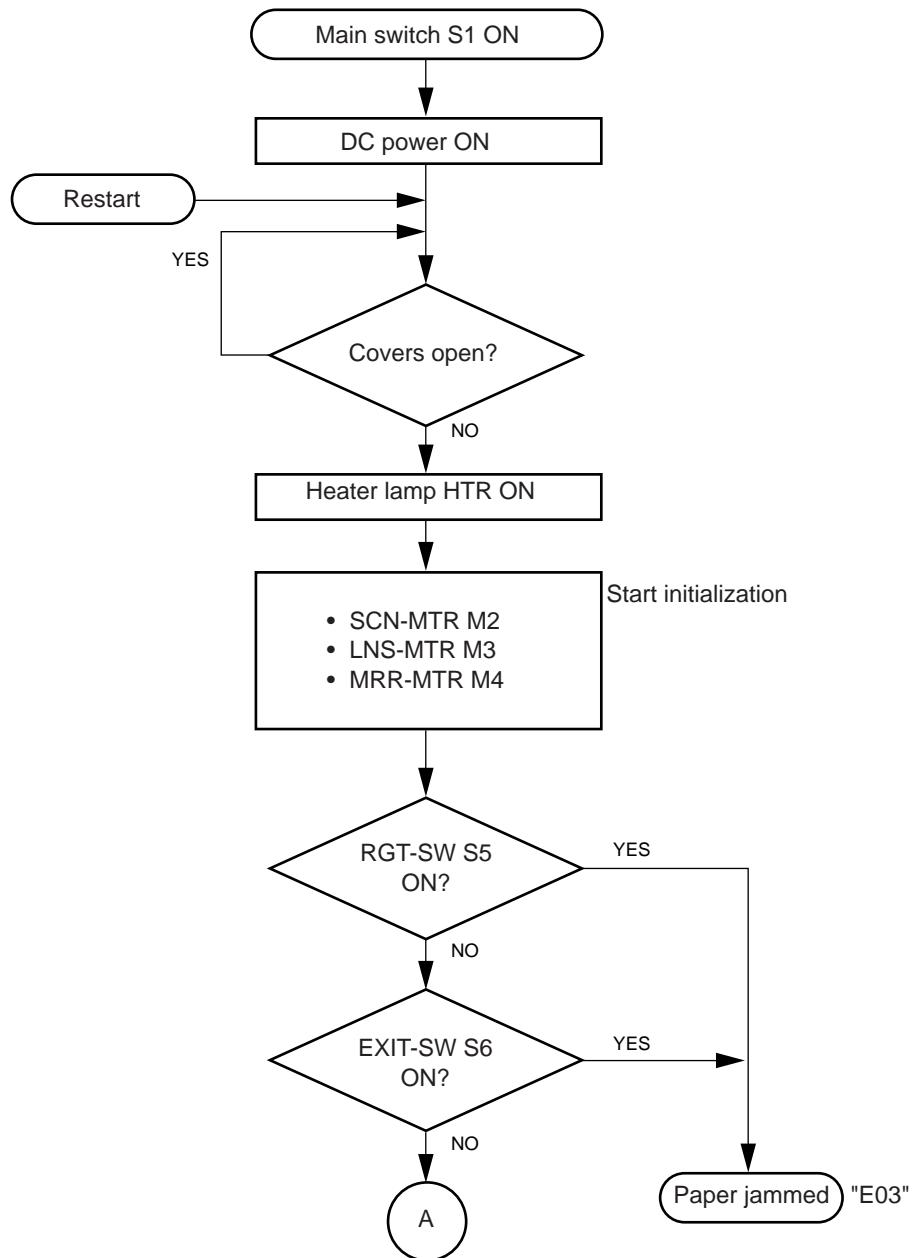
C-1) Service call

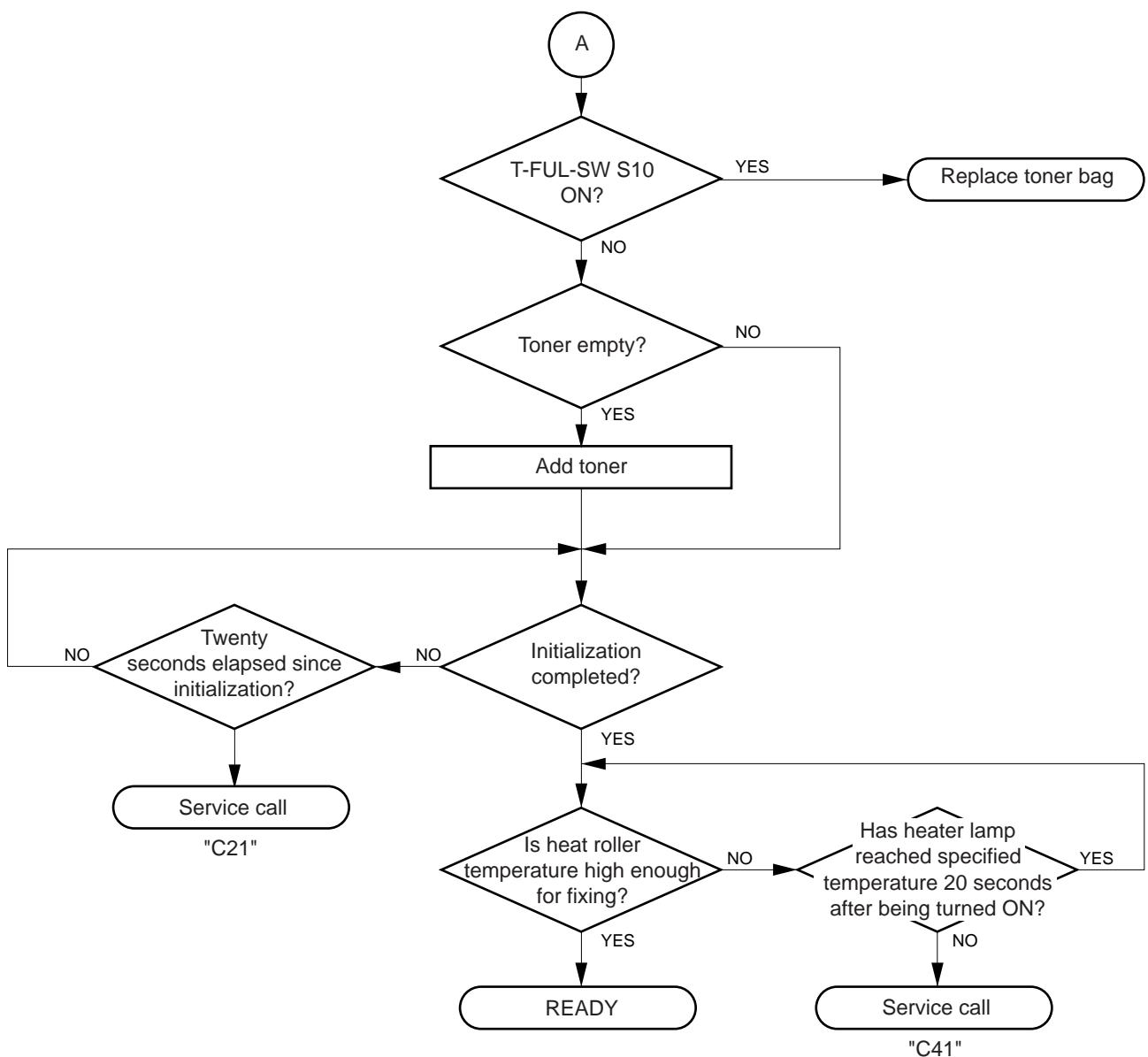
When the "CLEAR/STOP" key and the "8" key are pressed simultaneously while the "Service Call" symbol is flashing, an error code will be indicated in the copy quantity indicator.

For the contents of the error codes, refer to the "SERVICE HANDBOOK".

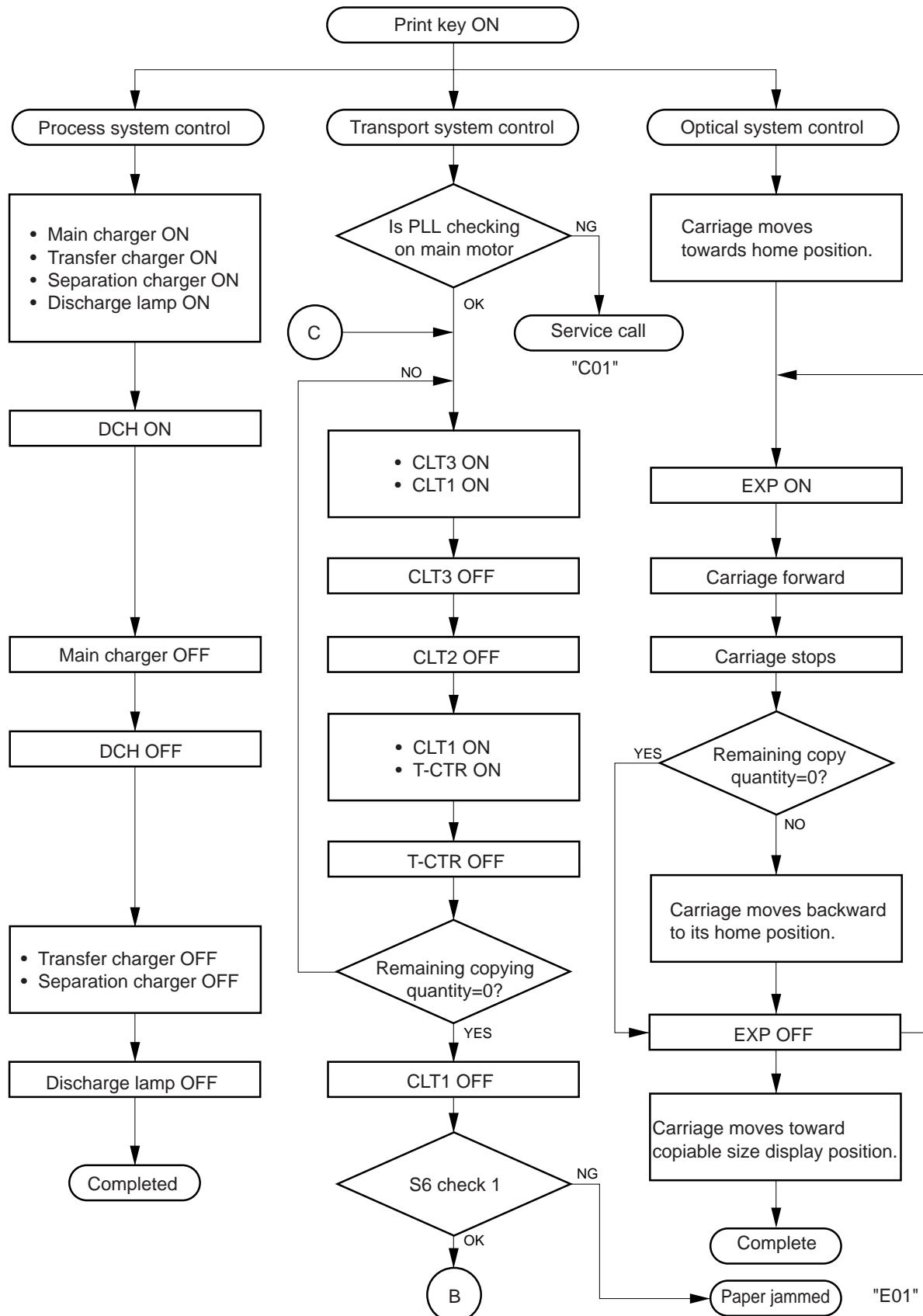
4.4 Flow Charts

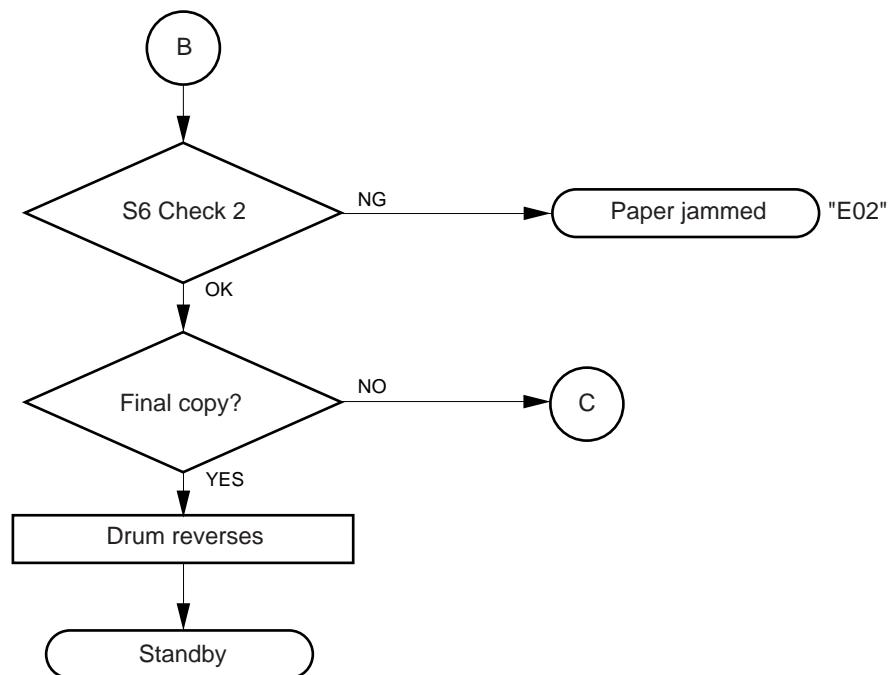
4.4.1 After power supply is turned ON.





4.4.2 Automatic feed copying



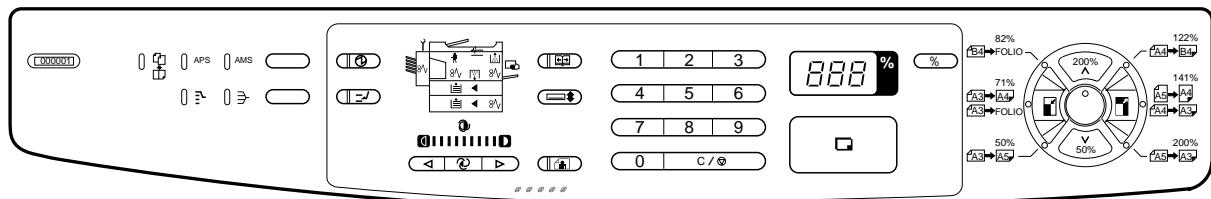


5. DISPLAY UNIT

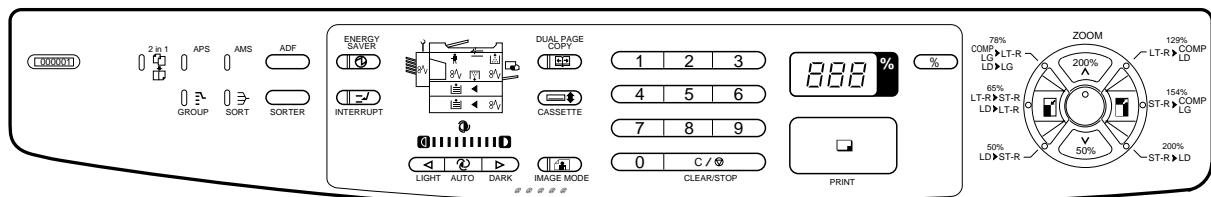
5.1 Control Panel and Indication Panel

The display unit consists of a key switch which operates copying and to select the mode, and an LED which displays machine condition and messages.

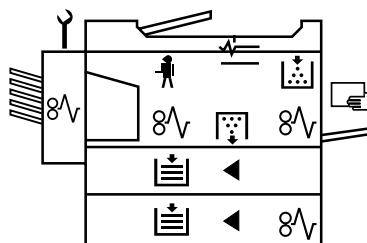
Signs and symbols are turned ON or flash when the attention of the operator needs to be drawn.



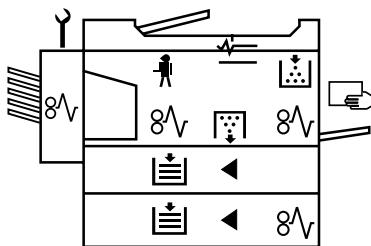
For Europe



For the U.S.A. and Canada



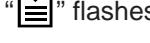
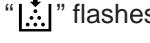
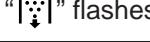
5.2 Items Displayed on Control Panel



- During normal copying operation

During warm up	When the power switch is turned ON the print key lights up red until capable of copying. The copy quantity and reproduction ratio display show "0".
Ready condition	When the machine is capable of copying condition, the print key lights up green and the copy quantity and reproduction ratio show "1".
While copying	When the print key is pressed, the print key lights up red. The copy quantity display displays a countdown and finishes at "1". After completion of copying, the copy quantity indicator returns to the initially set number.

- If a fault occurs (copying is not possible)

“  ” flashes	The symbol is displayed when the cassette selected has no paper (including “Insert Cassette”). Bypass feeding is possible.
“  ” flashes	The symbol is displayed when the toner in the toner cartridge runs out.
PRINT key flashes in red	The key flashes in red to indicate that the key-copy counter has been withdrawn when the optional key-copy counter is installed.
“  ” flashes	The symbol is displayed when the toner bag is full.
“8V” flashes	When the paper is jammed, the position is indicated ① Paper feed, ② Exit-paper area, ③ Paper feeding unit (option) ④ Sorter (option), ⑤ DF (option)
“  ” flashes	The symbol is displayed when a malfunction requiring service has occurred.
“  ” flashes	The symbol is displayed at the periodic maintenance cycle. (When the PM counter has exceeded the PM set value.) (Capable of copying.)

5.3 Relationship between Machine Condition and Operator's Action

Operation Condition	PRINT key	CLEAR/ STOP key	Digital keys	REPRO- DUCTION- RATIO selection key	AUTO EXPOSURE key (PHOTO key)	Manual exposure	Photo exposure	CASSETTE SELECTION key	INTER- RUPT key	ENERGY SAVER key	DUAL- PAGE COPY key	Sheet bypass
Warming up	○	○	○	○	○	○	○	○	○	○	○	○
Ready	○	○	○	○	○	○	○	○	○	○	○	○
Reproduction-ratio changing	—	○	○	○	○	○	○	○	○	○	○	○
Copying	—	○	—	—	○	○	—	○	○	—	—	—
Add paper	—	○	○	○	○	○	○	○	○	○	○	○
Add toner	—	○	○	○	○	○	○	○	○	○	○	○
Key copy counter not inserted (optional)	—	○	○	○	○	○	○	○	○	○	○	○
Bypass misfeed	—	○	○	○	○	—	—	○	○	○	○	—
Replace toner bag	—	—	○	○	○	○	○	○	○	○	○	○
Clear paper	—	—	—	—	—	—	—	—	—	—	—	—
Service call	—	—	—	—	—	—	—	—	—	—	—	—
Interrupt mode	○	—	—	—	—	—	—	—	—	—	○	—
Energy-saving mode	○	—	—	—	—	—	—	—	—	—	○	—

○: Machine operates or indicates in accordance with the operator's action. —: Operation is ignored.

- (1) By pressing the ENERGY SAVER key or the PRINT key, the energy-saving mode will be cancelled.
- (2) During copying, avoid changing exposure as far as possible.
- (3) The function of the CLEAR/STOP key changes in the following manner according to the machine status.
 - During copying Interruption of the copying (Stop function The copy quantity indicator will not change.)
 - When not copying When pressed once, the copy quantity indicator returns to "1".
 - (4) During copying, avoid sheet bypass feeding because of possible paper jamming.

(Note) The interrupt mode will be automatically cancelled when the machine is not used for 45 seconds.

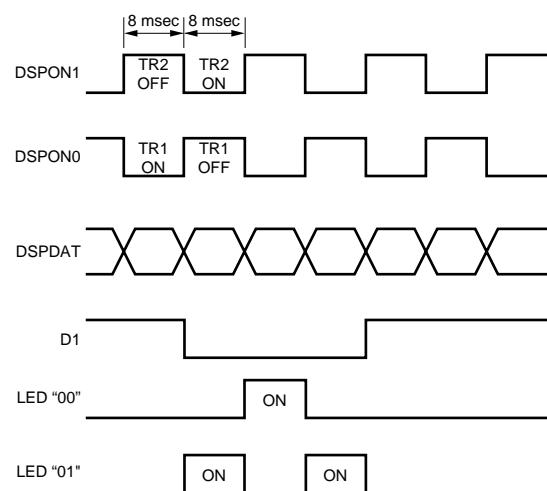
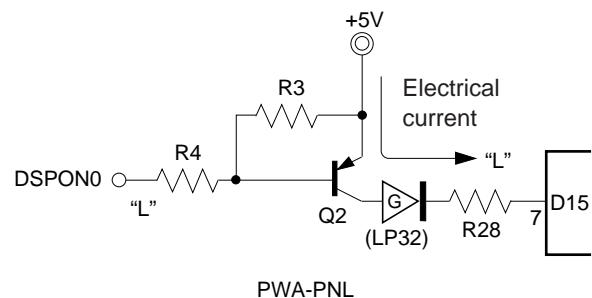
5.4 LED Display Circuit

(1) LED display method

Described here is the LED for "dual-page copying" display when "DP" comes ON. When the DSPON0 signal goes to "L" level, transistor Q2 is turned ON. When pin 7 of the IC (D15) goes to "L" level, electrical current flows through the transistor to the LED (DP) from +5V. In other words the LED (DP) comes ON.

(2) The actual circuit is controlled as follows:

- DSPON0 and DSPON1 signal goes to "L" level alternatively for 8 msec.
- Q1 or Q2 goes to the ON condition when the DSPON0 or DSPON1 signal is at "L" level.
- The LED ON/OFF signal from LGC is inputted to the IC SIN (pin 5) terminal via the DSPDAT signal (serial data).
- LED ON/OFF signal is outputted in parallel to D1-D16 output terminal, after being inputted to IC in series.



Conditions for LED to come ON

- ① The transistor (Q1 or Q2) connected on the anode side of LED is ON.
- ② The output connected to the cathode side of the LED is at "L" level.

When ①, ② above are fulfilled, the LED is turned ON.

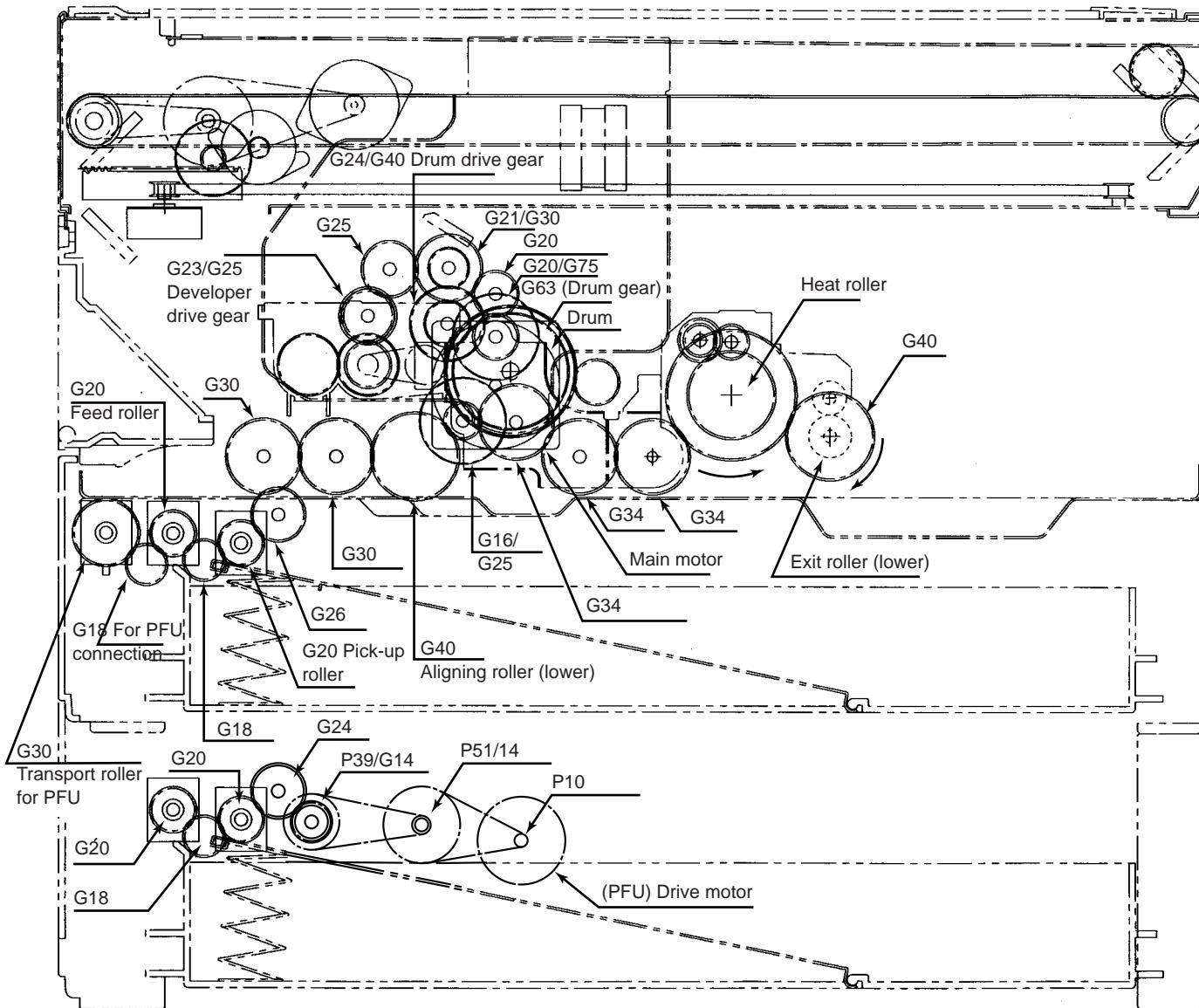
Listed below are the names of LEDs of which ON/OFF is controlled by the DSPON0 signal and the DSPON1 signal.

	DSP-ON0	DSP-ON1
DAT1	2 IN 1	SRV
DAT2	APS	ADFJ
DAT3	AMS	SRTJ
DAT4	GRP	PM
DAT5	SRT	TE
DAT6	PS	MFJ
DAT7	INT	EXTJ
DAT8	EXP1	TF
DAT9	EXP2	FJ1
DAT10	EXP3	PE1
DAT11	EXP4	CS1
DAT12	EXP5	PE2
DAT13	EXP6	CS2
DAT14	EXP7	FJ2
DAT15	EXP8	AUTO
DAT16	EXP9	PHOT
DAT17	MAG2-g	MAG1-g
DAT18	MAG2-b	MAG1-b
DAT19	MAG2-a	MAG1-a
DAT20	MAG2-f	MAG1-f
DAT21	MAG2-e	MAG1-e
DAT22	MAG2-d	MAG1-d
DAT23	MAG2-c	MAG1-c
DAT24	ZM50	MAG3-g
DAT25	ZM71	MAG3-b
DAT26	ZM82	MAG3-a
DAT27	ZM100	MAG3-f
DAT28	ZM122	MAG3-e
DAT29	ZM144	MAG3-d
DAT30	ZM200	MAG3-c
DAT31	DPC	%
DAT32	RDY	WAIT

6 DRIVE MECHANISM

6.1 Construction

The drive mechanism is so constructed as to drive the drum, developer unit, heat rollers (including the cleaning felt roller), paper exit roller and paper feed rollers (copier's and PFU's transport rollers) by means of the main motor.

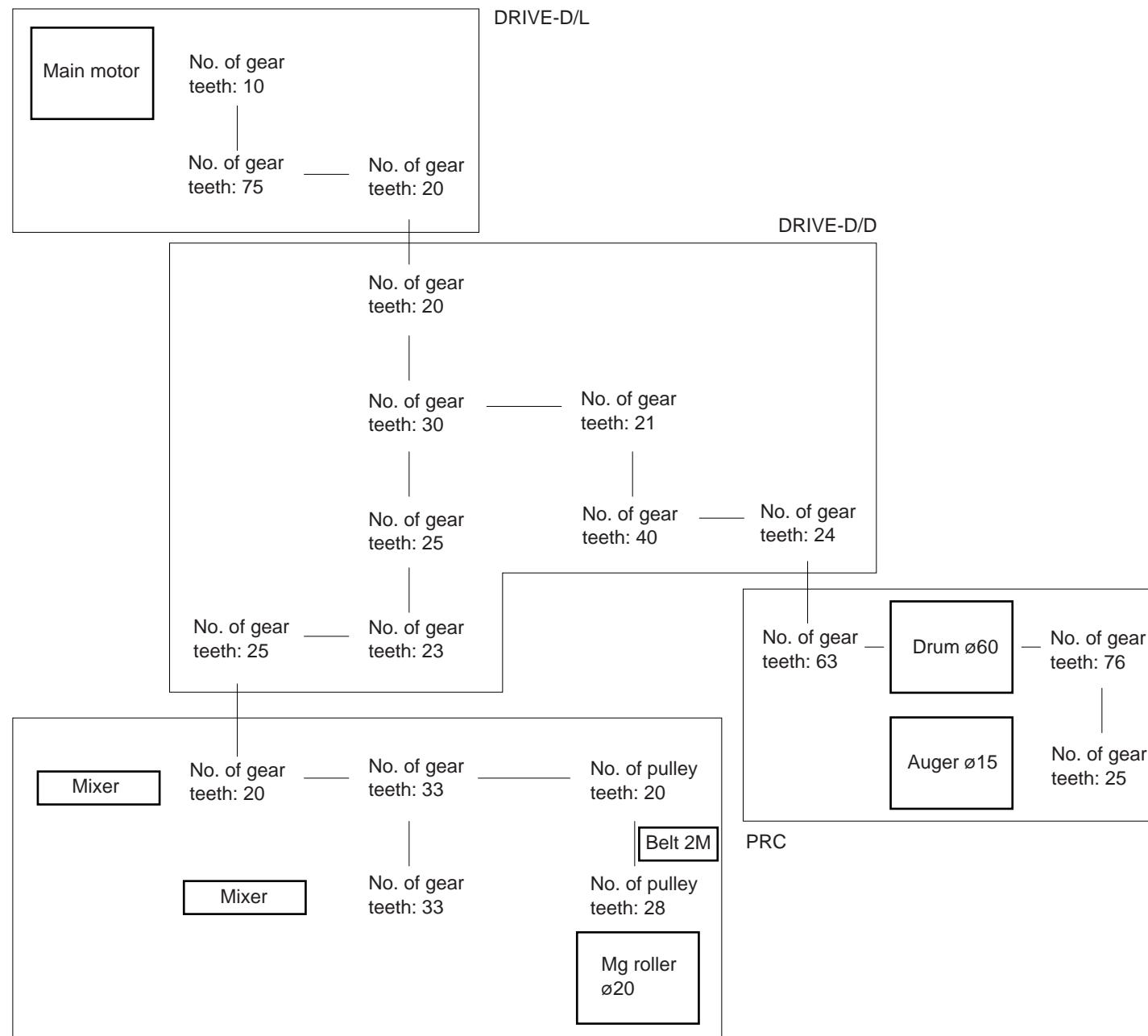


All parts except the main motor are located inside the frames.

Dirve mechanism (as seen from the rear)

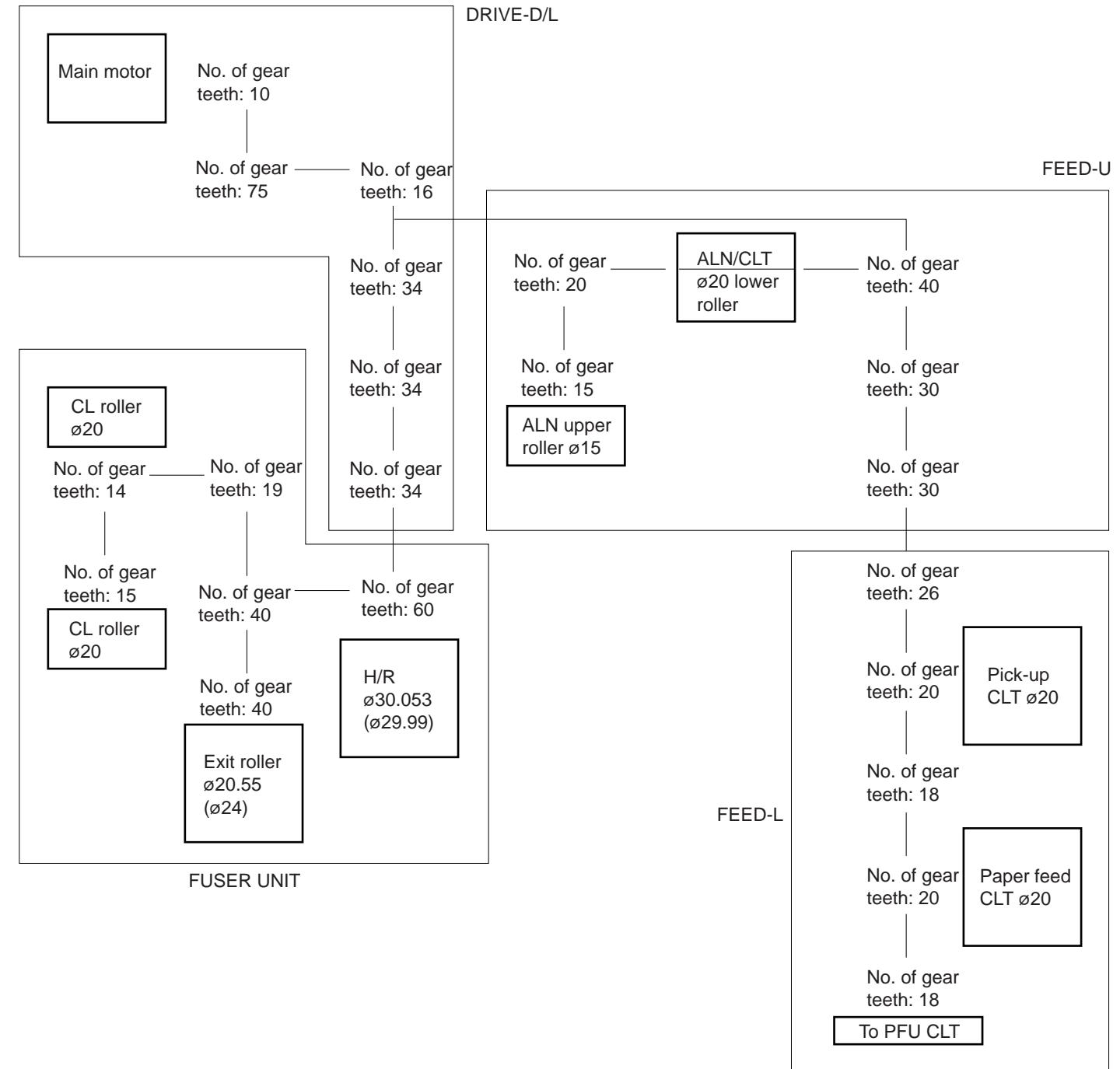
Upper Unit Drive

The horizontal bar (—) indicates the same shaft.



Lower Unit Drive

The horizontal bar (—) indicates the same shaft.



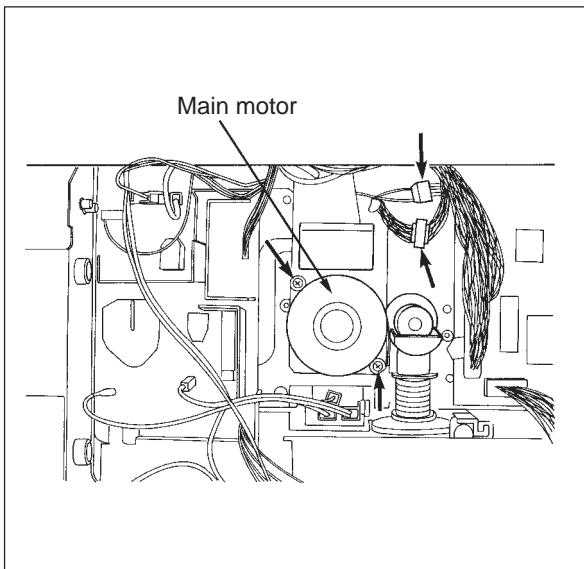
6.2 Explanation of Functions

- Drum drive Transmits the rotation of the main motor to the gears and drum drive gear to drive the drum.
- Developer unit drive Transmits the rotation of the main motor through gears to the developer-unit drive gear to drive the developer unit.
- Heat roller drive Transmits the rotation of the main motor through gears to the heat roller gear to drive the heat roller.
- Exit roller drive Drives the exit roller gear through gears.
- Copier's aligning roller Drives the copier's aligning roller through gears.
- PFU transport roller Drivers the transport roller through the copier's paper feed unit.

6.3 Disassembly and Replacement

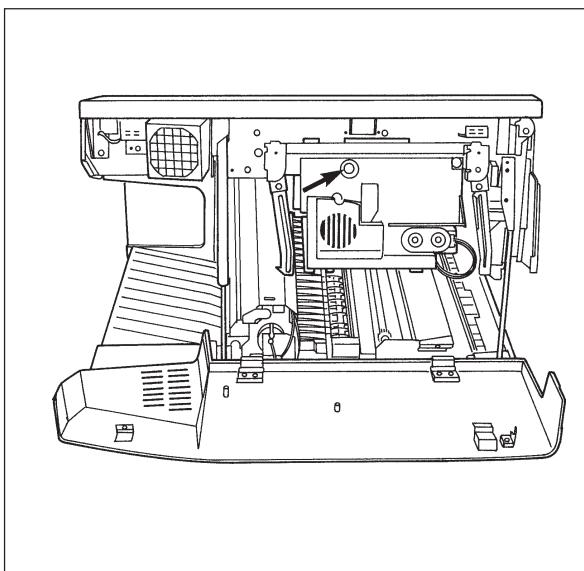
6.3.1 Main motor

- (1) Remove the rear cover.
- (2) Disconnect two connectors.
- (3) Remove two screws.

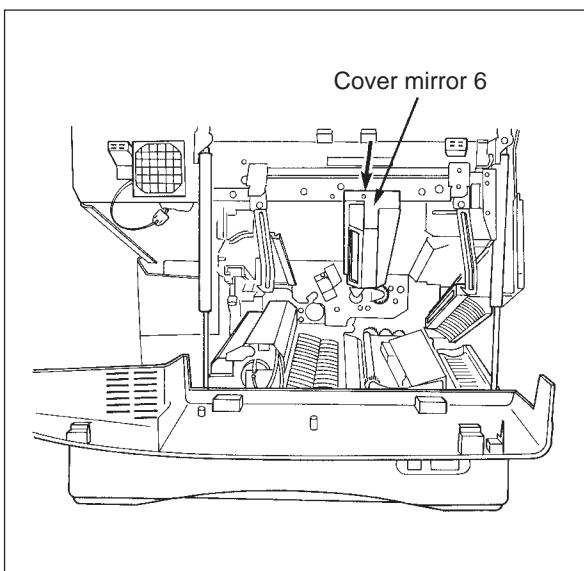


6.3.2 Drum drive gear and developer drive gear

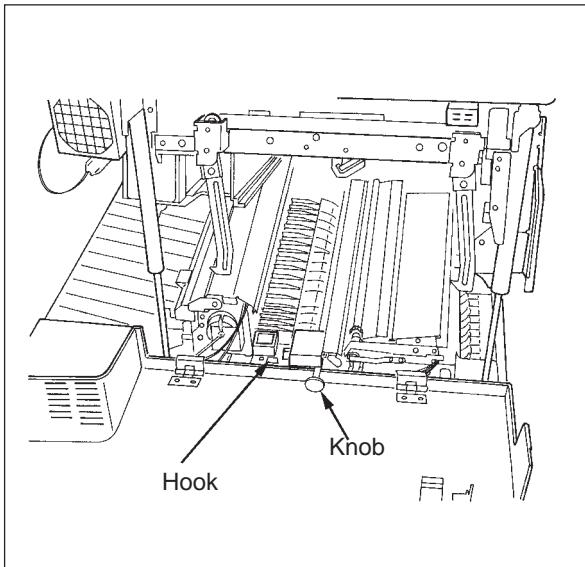
- (1) Remove the process unit (2 screws).



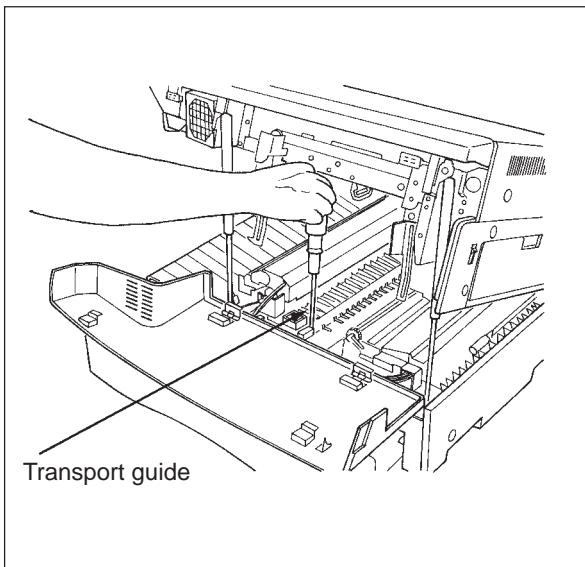
- (2) Remove the cover mirror 6 (1 screw).



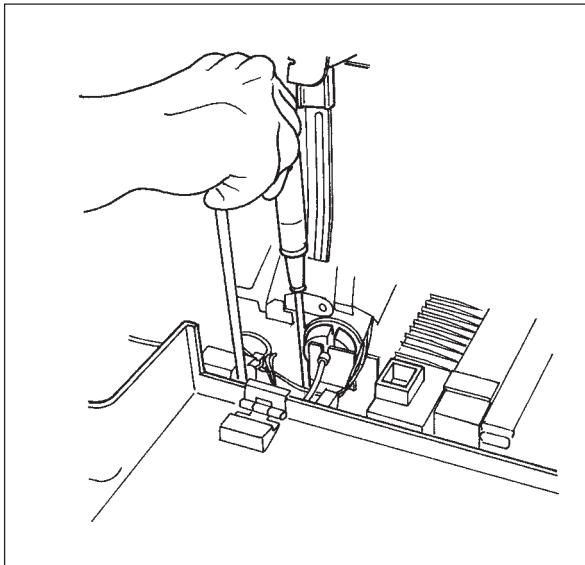
(3) Remove the transfer/separation charger (Refer to 9.3.6).



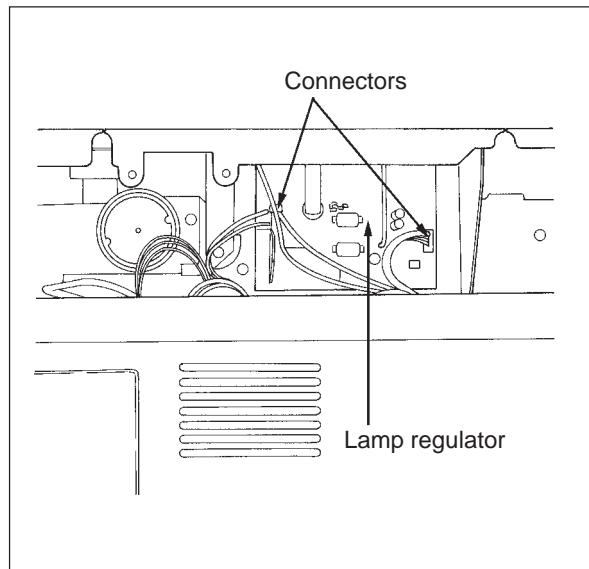
(4) Remove the transport guide (1 screw and 1 blue connector at the rear).



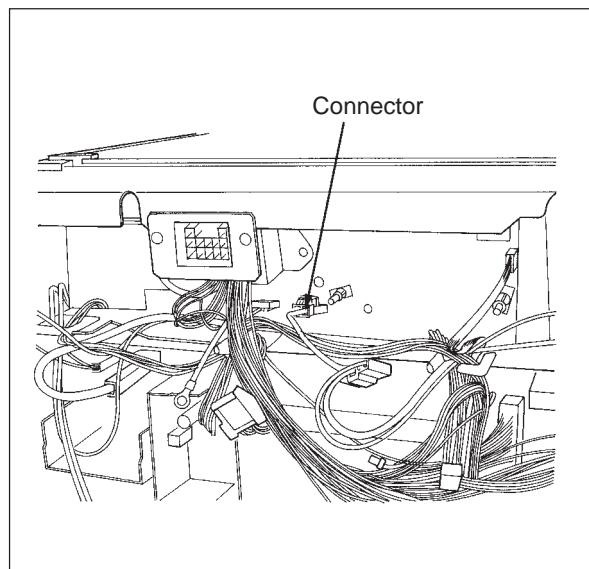
(5) Remove the inner cover (lower left).
(6) Remove the fuser unit (1 screw).



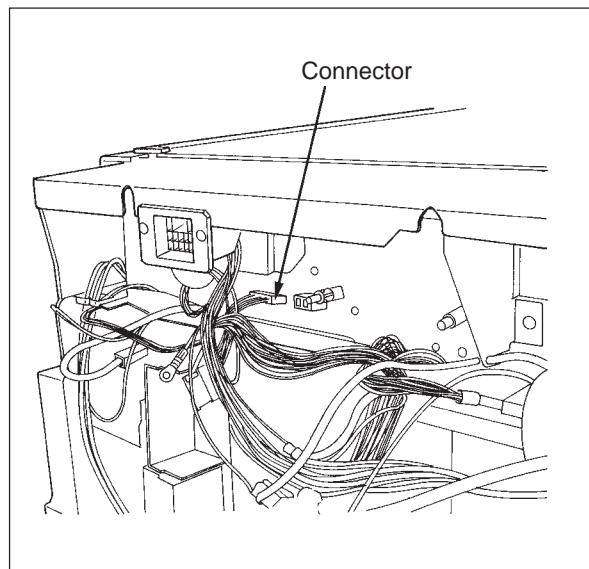
(7) Remove the lamp regulator (two connectors).



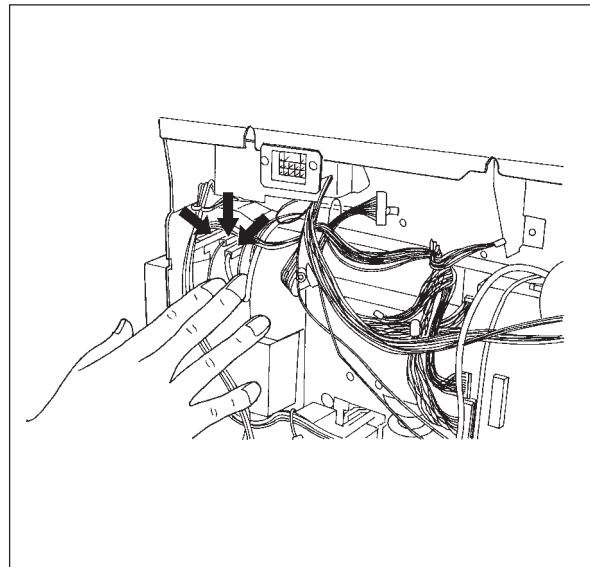
(8) Remove the exposure lamp and power supply connector.



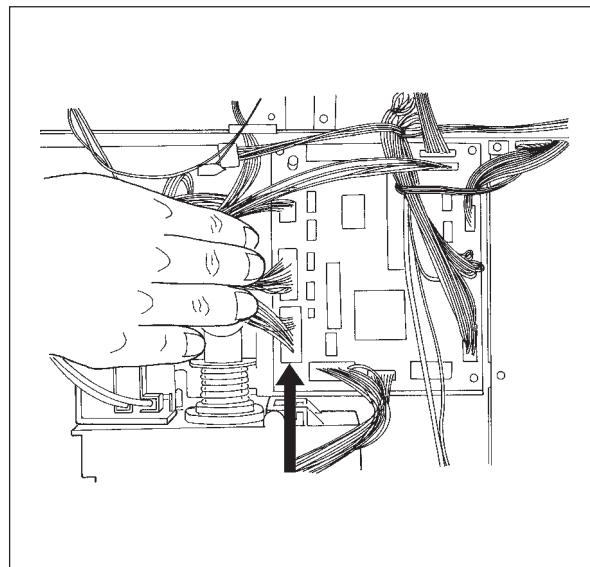
(9) Disconnect the connector for the auto exposure, lens switch and mirror motor.



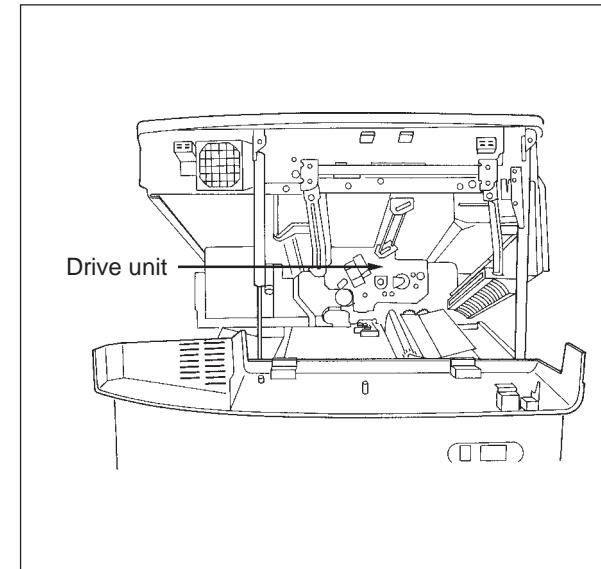
(10) Pull out the three connectors for the main charger and the bias wire from the high-voltage transformer.



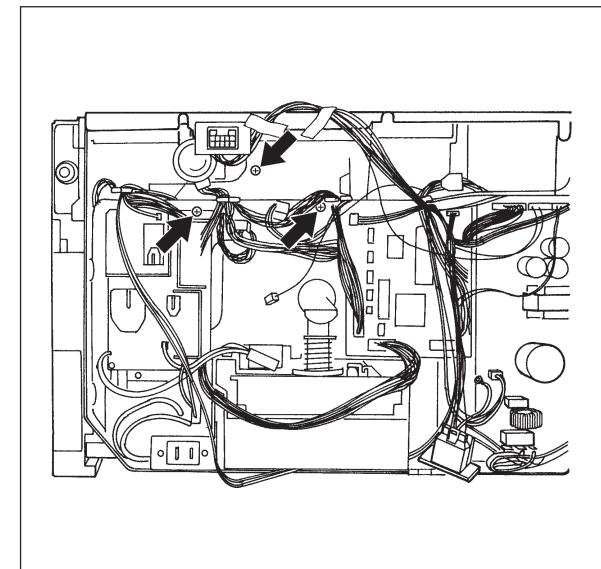
(11) Disconnect the connector for the process unit.



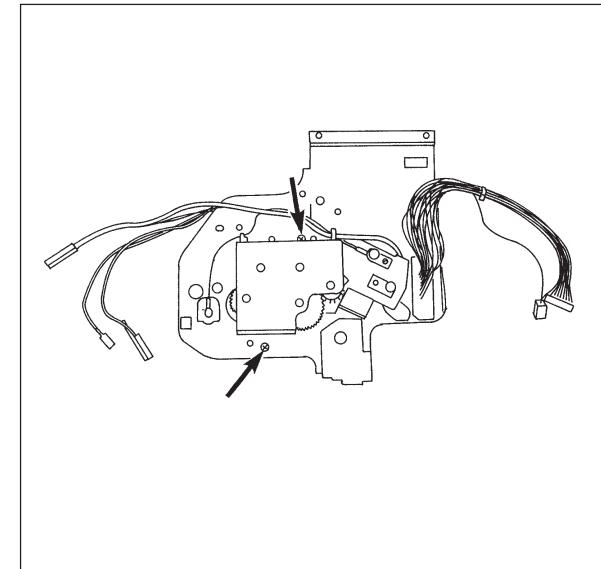
(12) Remove the drive unit from the rear inside of the machine (3 screws).



- Close the clamshell and remove 2 screws from each of the 2 screw holes on the rear frame.

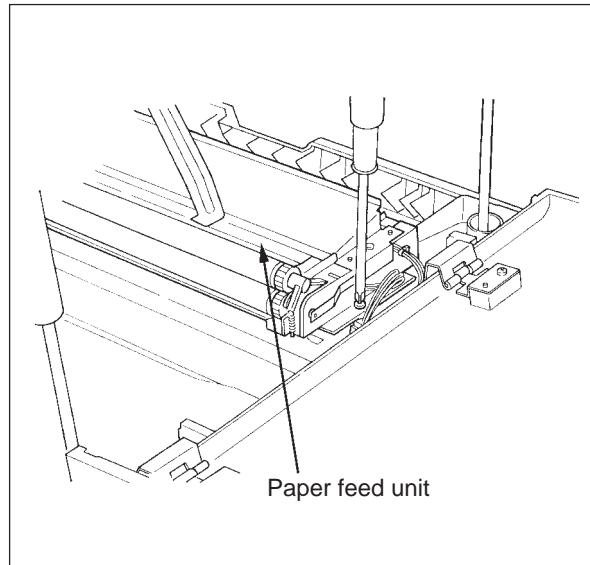


(13) Removing two screws, take out the bracket and the gear can be replaced.

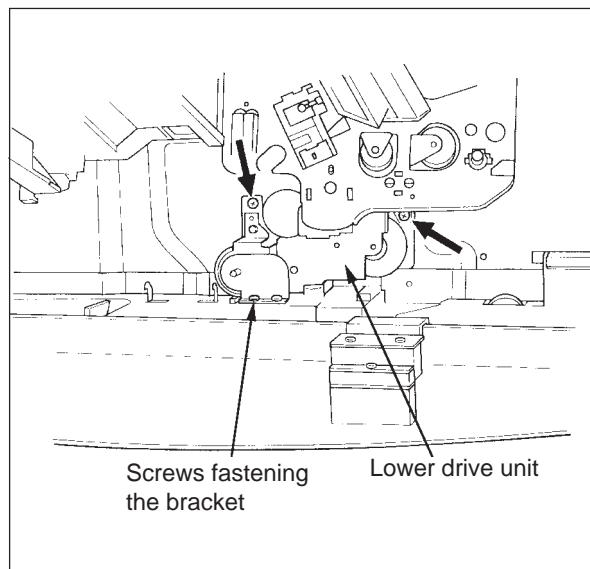


6.3.3 Lower drive unit

- (1) Remove the fuser unit.
- (2) Remove the transfer/separation charger.
- (3) Remove the transport guide.
- (4) Remove the connector cover of the feeder unit.
- (5) Remove the feeder unit (1 screw and connector).

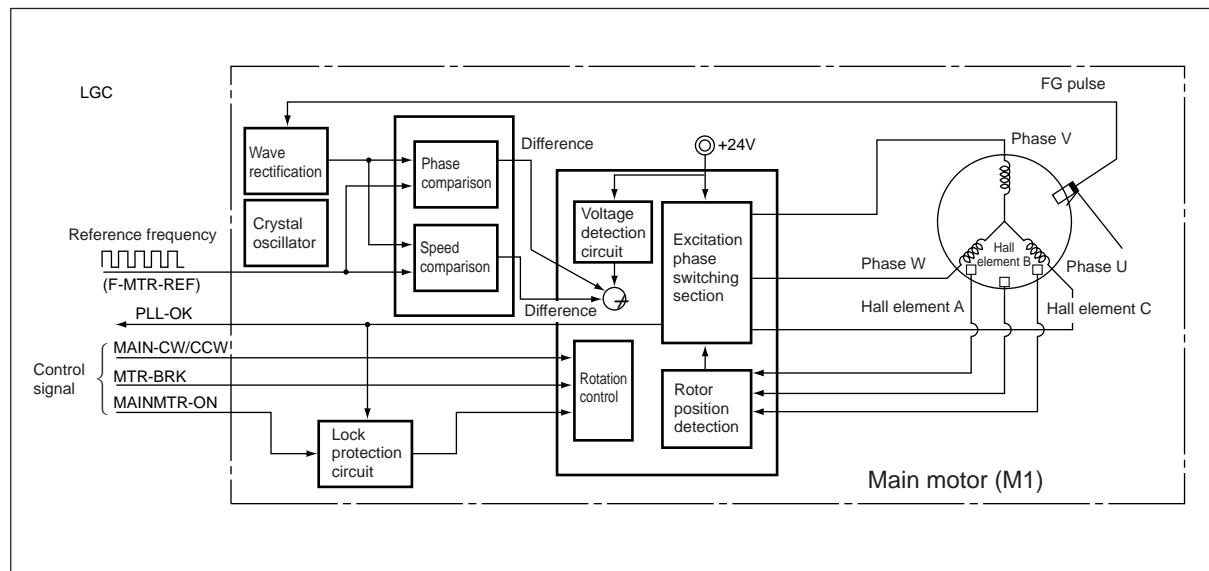


- (6) Remove the lower drive unit bracket (1 screw) and separate the drive unit from the bracket (2 screws).



6.4 Main Motor

6.4.1 Main motor drive



- (1) LGC outputs a control signal for main motor rotation. (MAIN-CW/CCW: Rotation direction, MAIN-MTR-ON: Motor rotation command)
- (2) The excitation phase switching section excites each phase of the main motor → main motor rotates.
- (3) Hall elements A-C detects rotation position of motor (rotor).
- (4) The excitation phase switching section switches the excitation of each phase.
(By repeating (2) through (4), the motor continues to turn.)
- (5) An FG pulse is generated by FG pattern attached to the main motor.
- (6) The FG pulse and the reference frequency are compared for their phase and speed, and their differences added to IC3.
- (7) Change the switch timing of the excitation phase switching section, according to the signal obtained at (6) above.
= Control so that the FG pulse and reference frequency are equal → main motor rotates at a fixed speed (lock-range condition).
- (8) As the main motor goes into the lock-range condition, the excitation phase switching section outputs a PLL-OK signal to LGC ("L" level).
- (9) When MTR-BRK from LGC goes to "L" level, the brake is applied to rotation of the main motor, and when the MAIN MTR-ON signal becomes "L" level, the main motor stops.

6.4.2 Control signal

(1) MAIN-CW/CCW (LGC → MTR: Input)

This is a signal to change the direction of rotation of the main motor. When the CW/CCW signal is at “L” level, the main motor rotates counterclockwise when viewed from the rear, and drives the developer, drum and heat roller in the designated direction.

(2) PLL-OK signal (MTR → LGC: Output)

When the FG pulse cycle difference against the reference frequency is within the range of +4.6% and -5.3%, it is defined as the lock range (normal state), and the signal becomes “L” and LED “ED1” comes ON.

(3) MTR-BRK signal (LGC → MTR: Input)

This is the signal to control the speed of the main motor. The brake is applied to the main motor when the signal becomes “L” level.

(4) MAINMTR-ON signal (LGC → MTR: Input)

This is a signal to turn ON/OFF the main motor. The main motor turns when this signal becomes “H” level.

(5) MOT-FG signal

This signal generates FG signals while the motor is rotating.

Signal level of motor circuit.

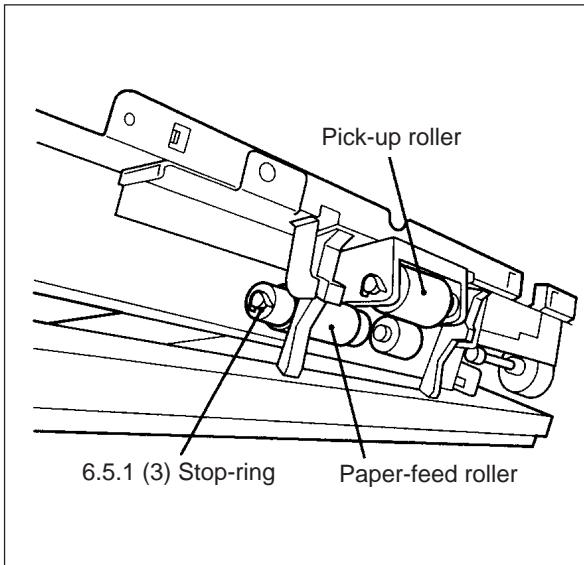
Signal name	“H” level	“L” level
MAIN-CW/CCW	CW direction	CCW direction
PLL-OK	Control deficiency	Normal
MOT-FG	Rotation pulse signal	
MTR-BRK	Brake OFF	Brake ON
MAINMTR-ON	Motor ON	Motro OFF

The signals are respectively the level on the input/output pins of IC1 and 3.

6.5 Bypass feed section (1560 only)

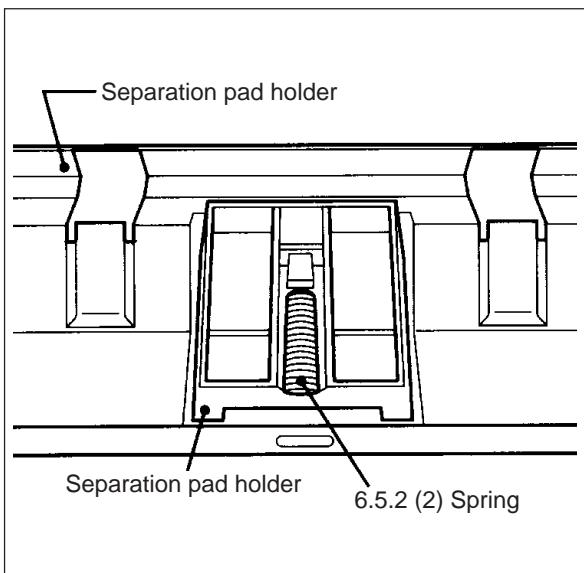
6.5.1 Bypass feed roller

- (1) Remove the main switch/door switch. (See item 2.4.2 [E-2])
- (2) Remove the feed roller stop-ring.
- (3) Take out the feed roller.



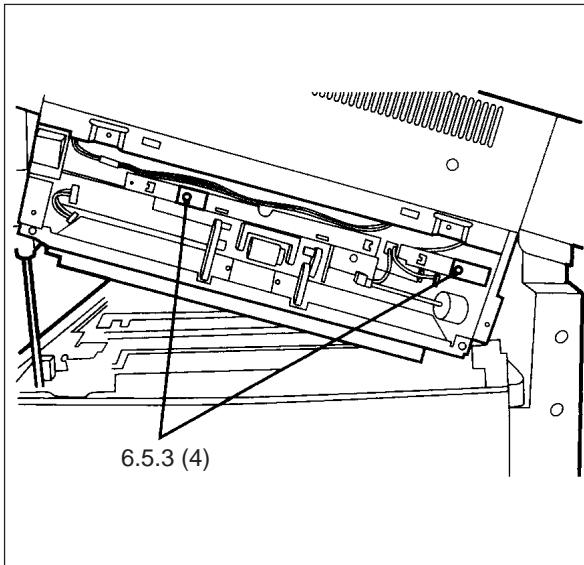
6.5.2 Removal of the separation pad

- (1) Remove the main switch/door switch (See item 2.4.2 [E-2]).
- (2) Take off the rear-side spring of the separation pad and remove the separation pad.



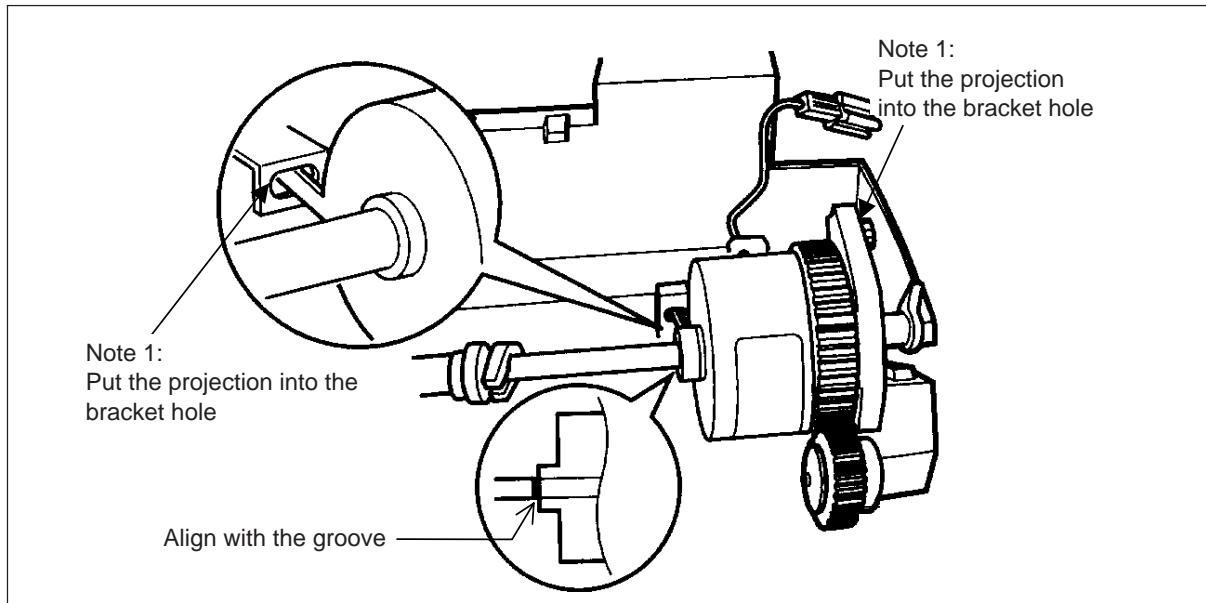
6.5.3 Removal of the clutch

- (1) Remove the main switch/door switch. (See item 2.4.2 [E-2])
- (2) Removal the clutch and the paper sensor.
- (3) Close the upper unit.
- (4) Remove 2 screws from the upper unit, slide the unit to the front and take it out in the direction of paper feeding.
- (5) Remove the hexagonal screw and the stop-ring of the clutch and take out the clutch.



<Notes>

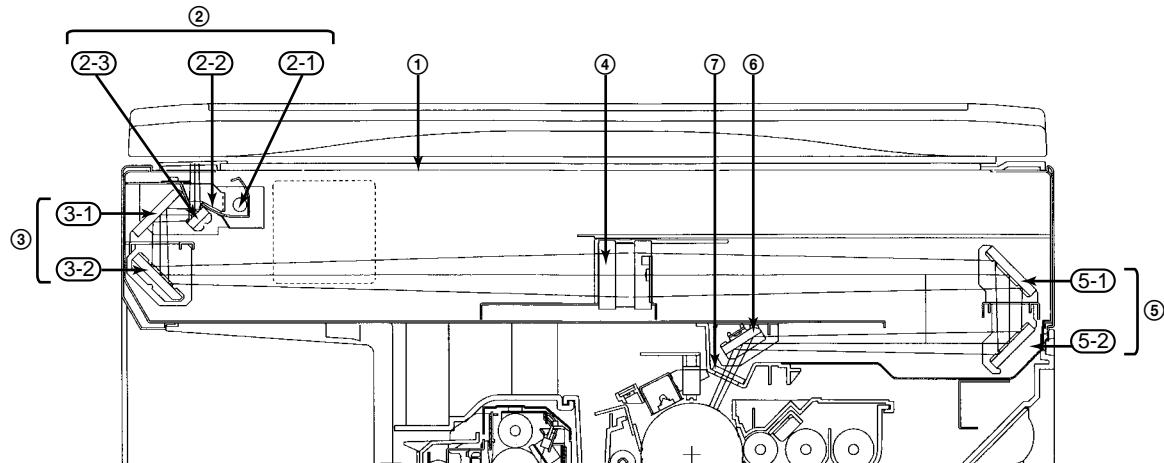
1. When installing the clutch, align the end face of the clutch to the shaft groove and align the hexagonal screw to the milling cutting surface. Insert the projection of the clutch and the gear arm in the hole of the bracket.
2. Confirm that there is no oil, etc. on the surface of the paper feed roller or the separation pad.
3. When reassembling the timing belt (removed when taking cut the pick-up roller) pass it through the upper side of the belt tensioner.
4. When installing the separation pad bracket to the copier, first free the paper stop lever by pushing down the pick-up roller downwards.



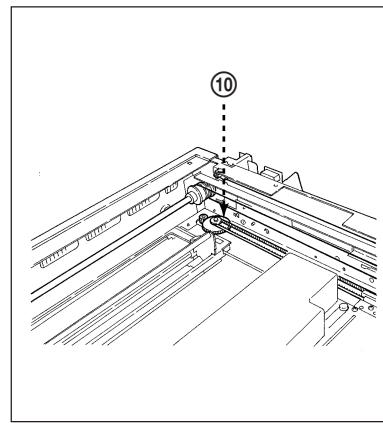
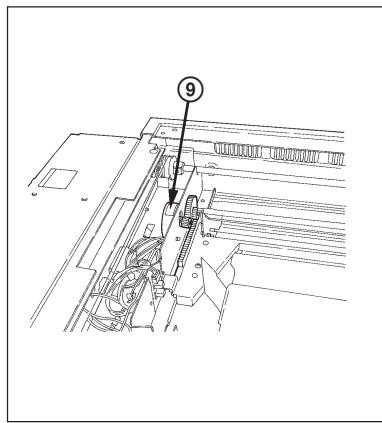
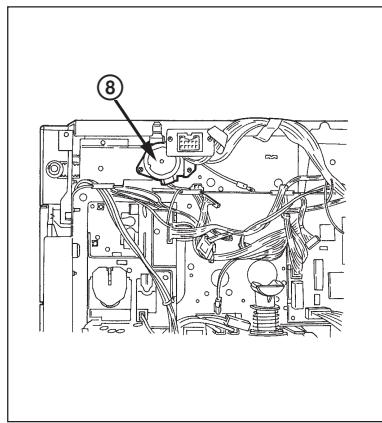
7. OPTICAL SYSTEM

7.1 Construction

The optical system consists mainly of the original glass, carriage 1, carriage 2, lens unit, mirror unit and drive motors.

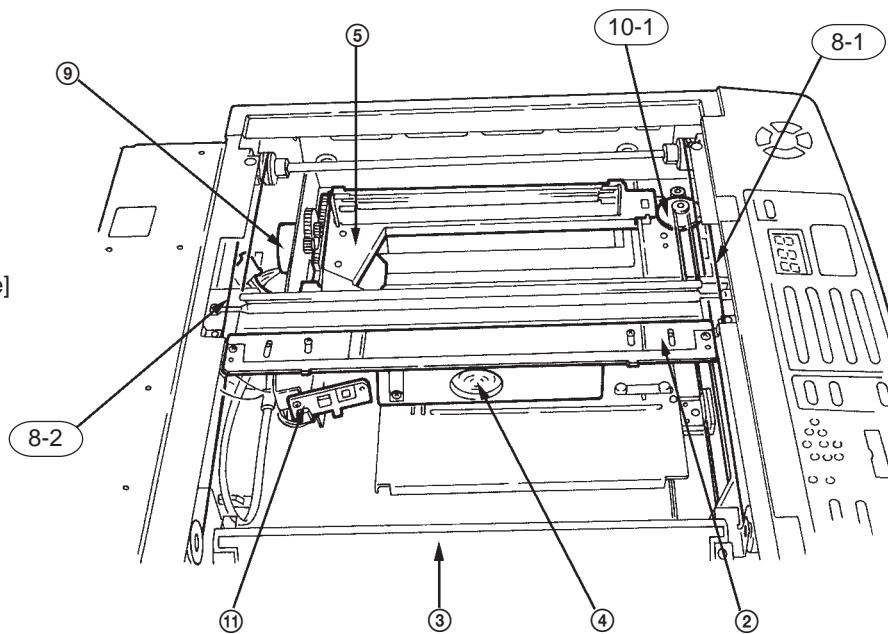
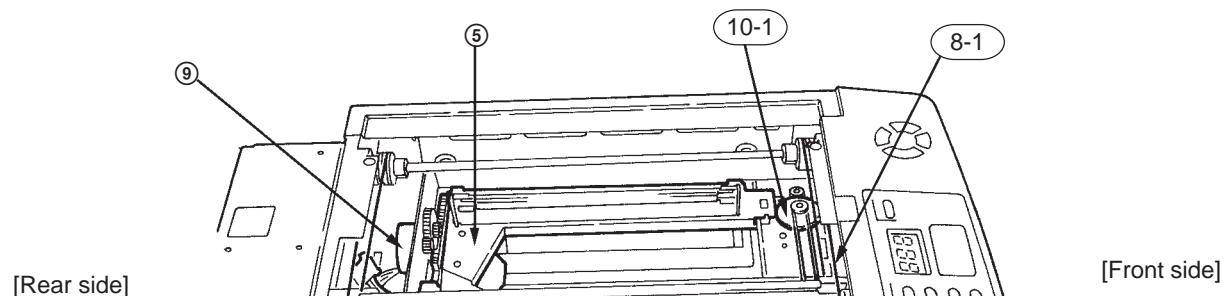


- ① Original glass
- ② Carriage 1 — (2-1) Exposure lamp, (2-2) Reflector, (2-3) Mirror 1
- ③ Carriage 2 — (3-1) Mirror 2, (3-2) Mirror 3
- ④ Lens unit
- ⑤ Mirror unit — (5-1) Mirror 4, (5-2) Mirror 5
- ⑥ Mirror 6
- ⑦ Slit glass



⑧ Scanning motor ————— ⑧-1, ⑧-2 Carriage drive wire
⑨ Mirror motor
⑩ Lens motor ————— ⑩-1 Lens drive belt (1 pc.)

[Feed side]



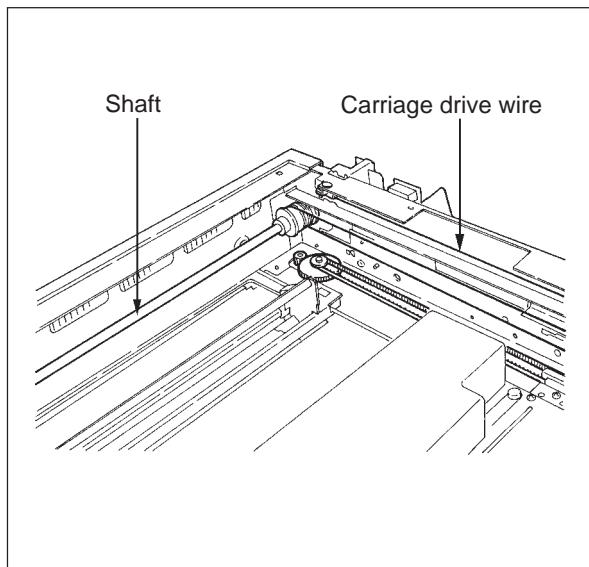
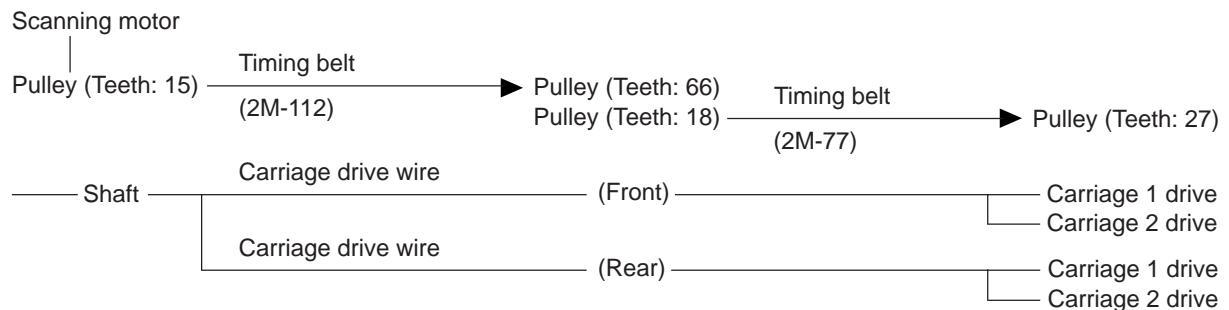
[Exit side]

⑪ Auto exposure PC board

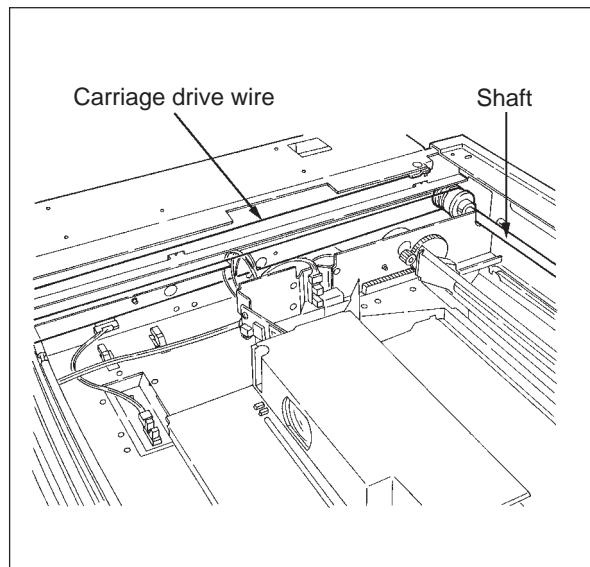
7.2 Explanation of Operation

7.2.1 Scanning motor

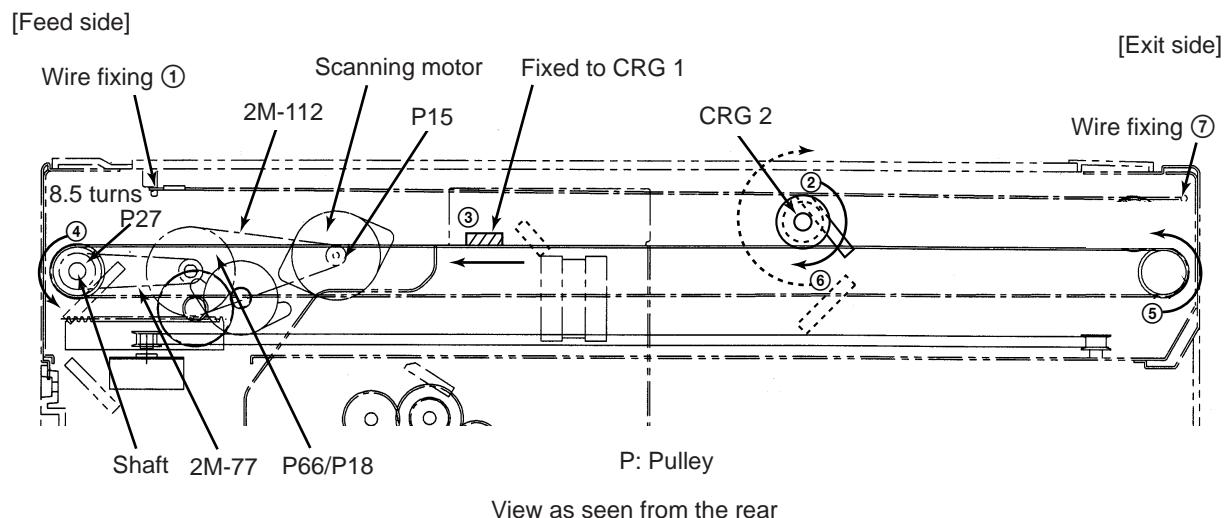
The rotation of the scanning motor (located on the rear) is transmitted to carriage 1 and 2.



View as seen from the rear

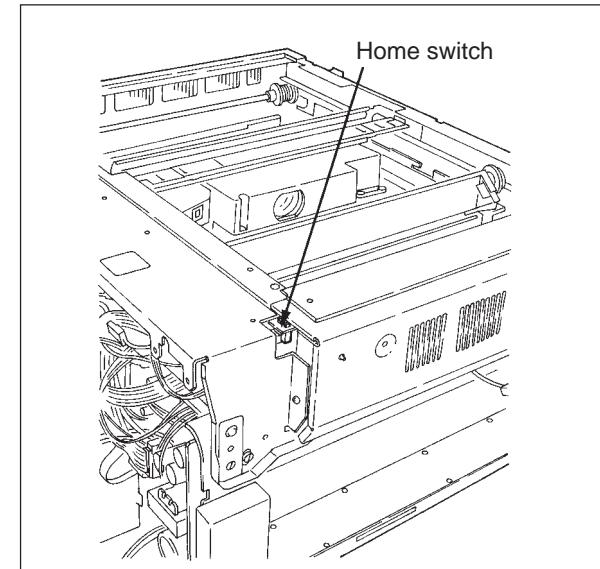


View as seen from the front



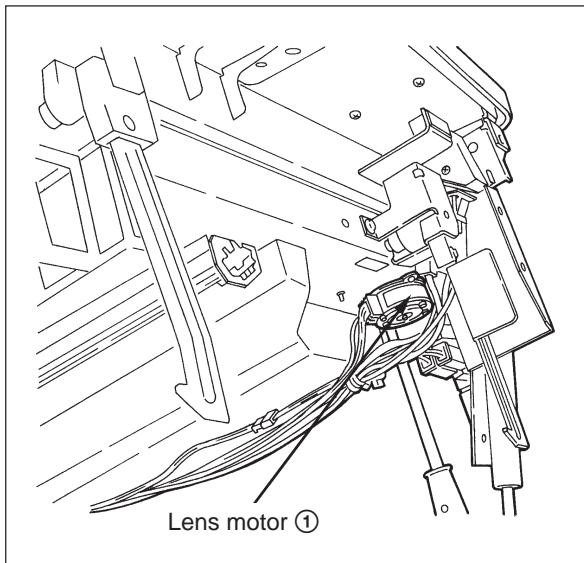
The scanning motor makes carriage 1 and 2 return to their home positions which are detected by carriage 1 passing the home switch.

When the PRINT key is pressed, the scanning motor causes carriage 1 and 2 to scan the original.

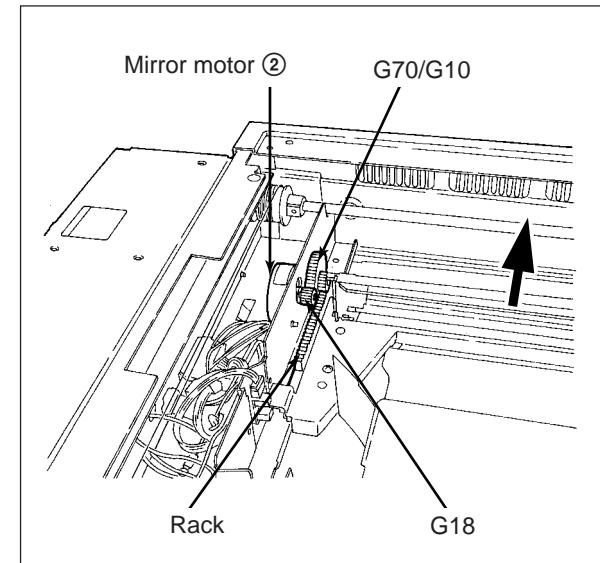


Rear side

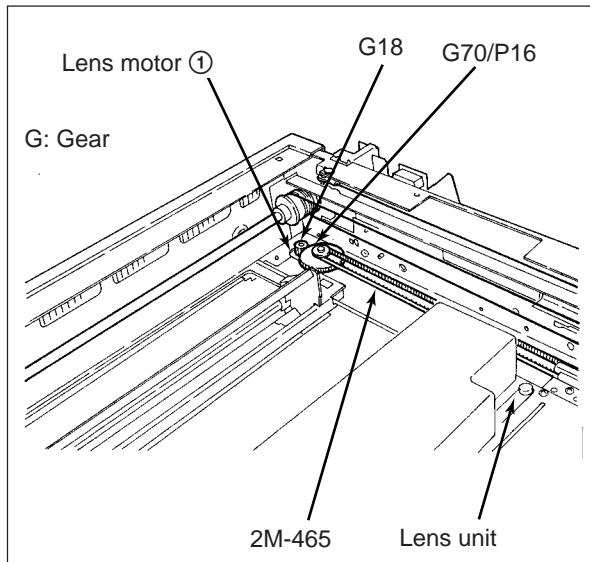
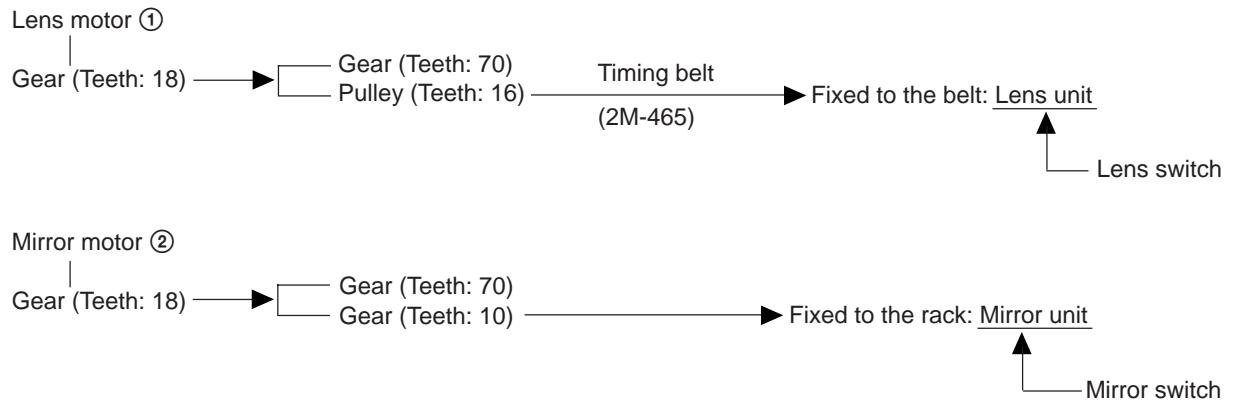
7.2.2 Mirror motor and lens motor



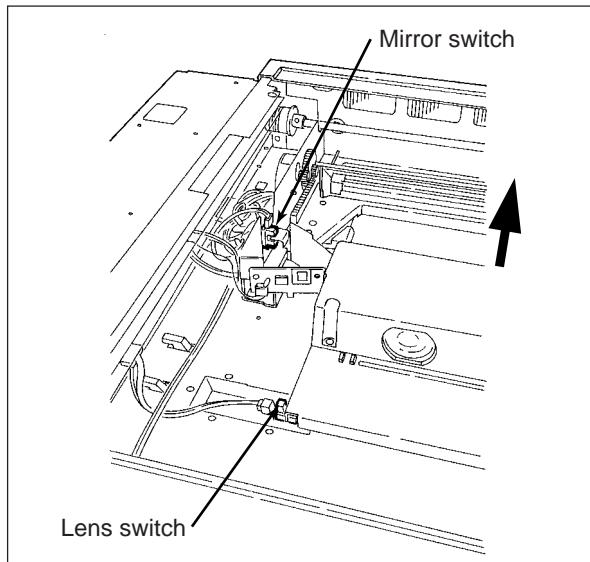
View with the process unit and the stay removed and the upper unit raised



View as seen from the front



View as seen from the rear



View as seen from the exit side

Immediately after the power on:

Both the lens unit and the mirror unit move from the position where the switches (lens switch and mirror switch) are turned on toward the feed side (arrow direction), respectively.

If the lens and mirror units were in the off position, they first move toward exit side, then after turning on the switch, move a specified amount toward the feed side, and stop at the actual-size (100%) position.

When a reproduction ratio is selected:

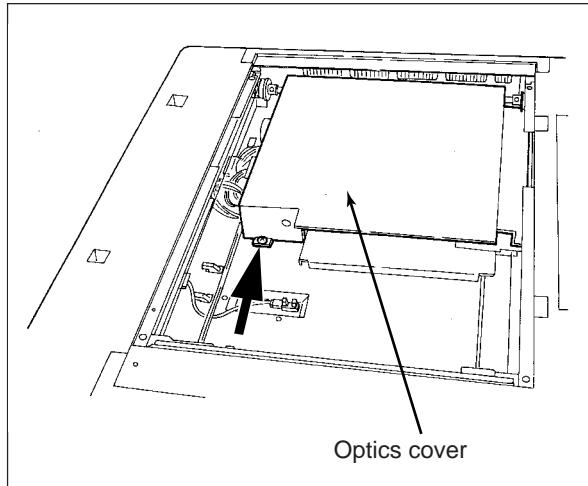
When a copy reproduction ratio is set, the lens unit and the mirror unit move to their respective positions for the specified reproduction ratio.

7.3 Disassembly and Replacement

At the time of disassembly or replacement, first remove the covers, process unit, original glass, etc., as required.

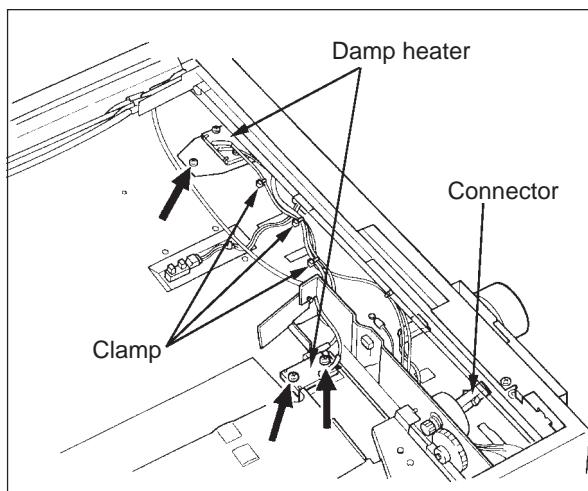
7.3.1 Auto exposure PC board and damp heater

- (1) Remove the original glass and move carriages 1 and 2 to the exit side.
- (2) Remove the optics cover (1 screw).



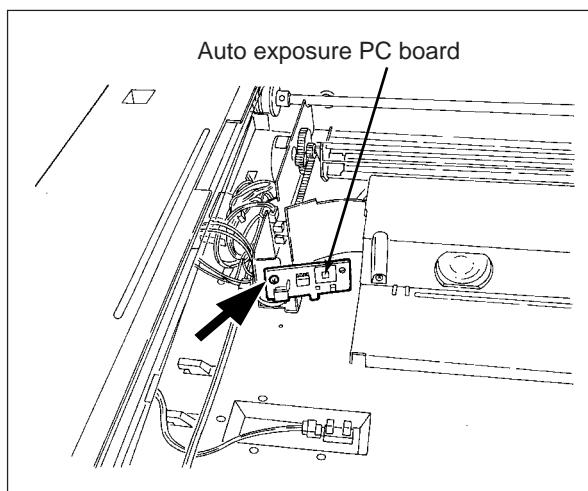
Damp heater: (Option)

- Remove three screws, three clamps and disconnect one connector.



Auto exposure PC board:

- Remove one screw, disconnect one connector and the PC board can be replaced.



7.3.2 Scanning motor (and timing belt)

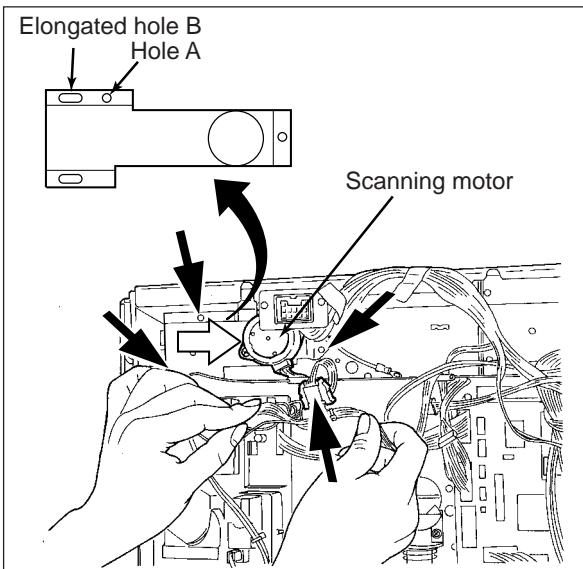
- (1) Remove the top cover.
- (2) Disconnect one connector.
- (3) After removing three screws, you can take out the whole unit. At this time, the timing belt (2M-77) is also removed.

Note: 1. When reassembling the parts, make sure that the timing belt is securely placed on the pulleys (P66/P18) and the shaft drive pulley (P22).

2. The scanning motor is screwed on in the position of the hole A at the time of shipping from the factory.

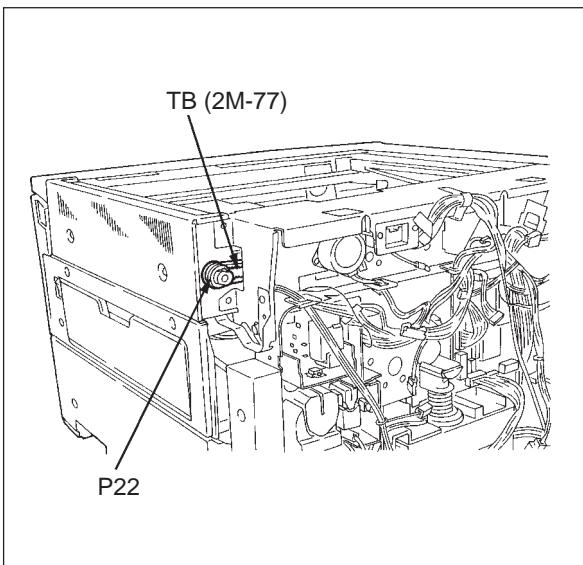
When the belt tension adjustment is necessary, reinstall the screw at the elongated hole B (not the hole A).

After having pushed the scanning motor in the direction of the arrow, install it.



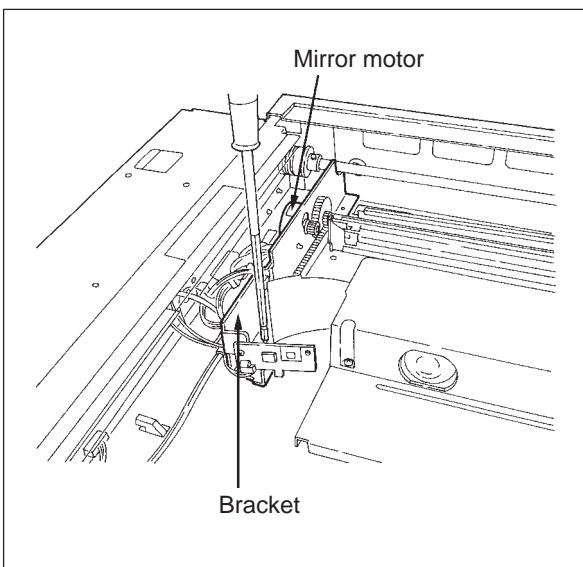
- (4) After taking out the unit, remove two screws and the motor is removed.

Note: When reassembling the parts, make sure that the timing belt is securely placed on the pulleys (P66/P18) and the shaft drive pulley (P22).



7.3.3 Mirror motor

- (1) Remove the original glass.
- (2) Remove the optics cover (1 screw).
- (3) After removing two screws, take out the bracket.
- (4) Remove two screws and disconnect one connector from the bracket and the mirror motor is removed.



7.3.4 Lens motor

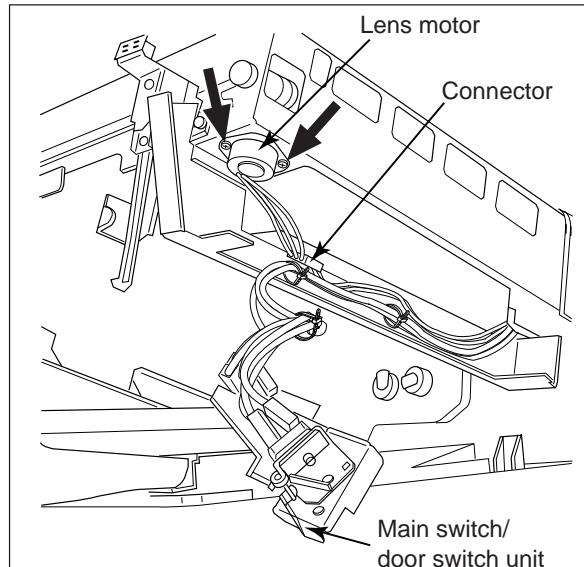
7.3.4.1 1550

- (1) Remove the main switch, door and switch unit (see item 2.4.2 [E-1]).
- (2) Remove the connector of the lens motor.
- (3) Remove the lens motor (2 screws).

Note: The shape of the mirror motor and the lens motor is same, but the output is different.

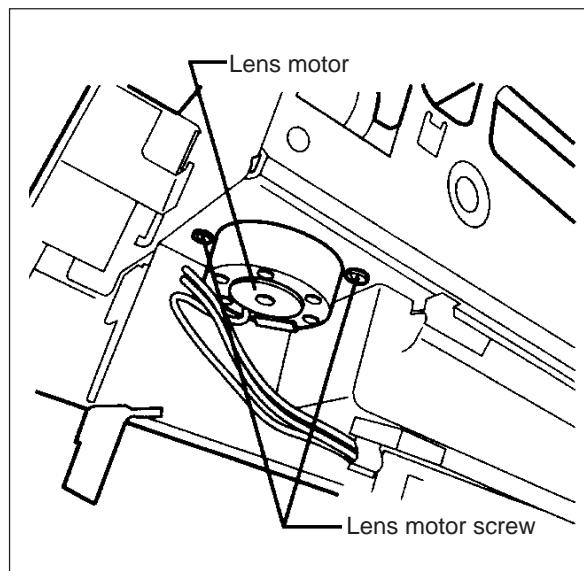
Mirror motor : silver maker name

Lens motor : red maker name



7.3.4.2 1560

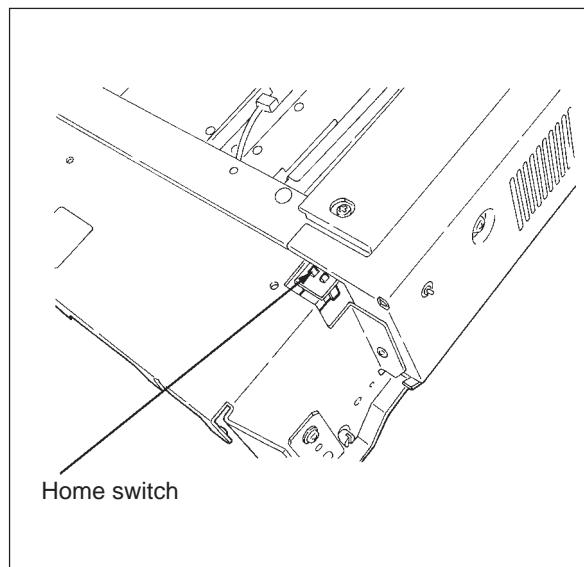
- (1) Remove the main switch/door switch. (See item 2.4.2 [E-2])
- (2) Remove the lens motor connector.
- (3) Remove the lens motor screw.



7.3.5 Home switch, mirror switch and lens switch

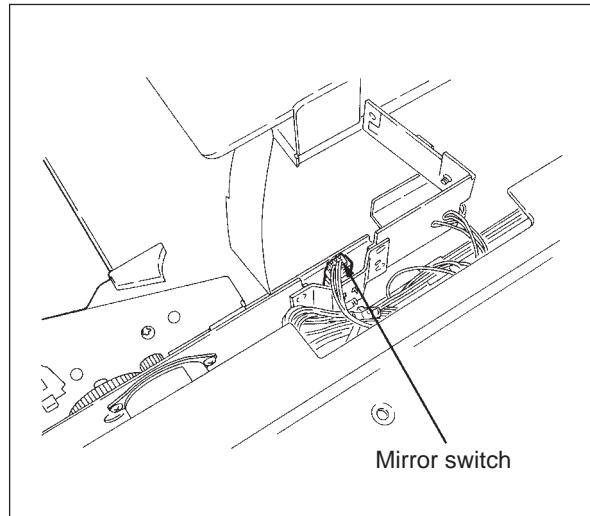
Home switch:

- (1) Remove the top cover.
- (2) Remove the switch by disengaging its claws.



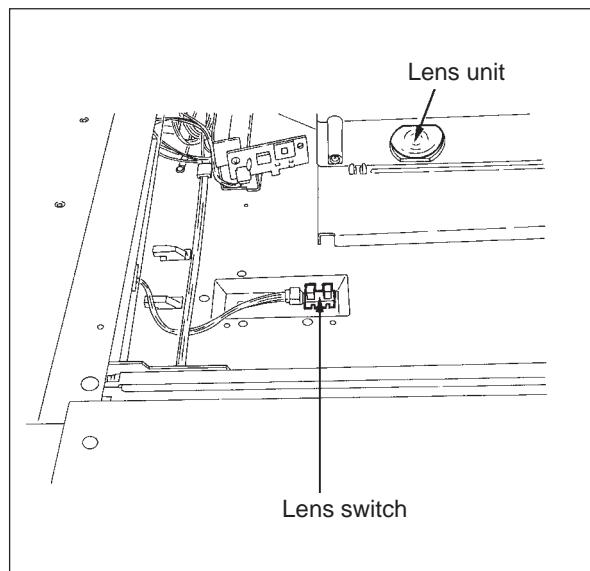
Mirror switch:

- (1) Remove the original glass.
- (2) Remove the optics cover (1 screw).
- (3) Move both carriages 1 and 2 to the exit side and the mirror unit to the feed side.
- (4) Remove the switch by disengaging its claws.



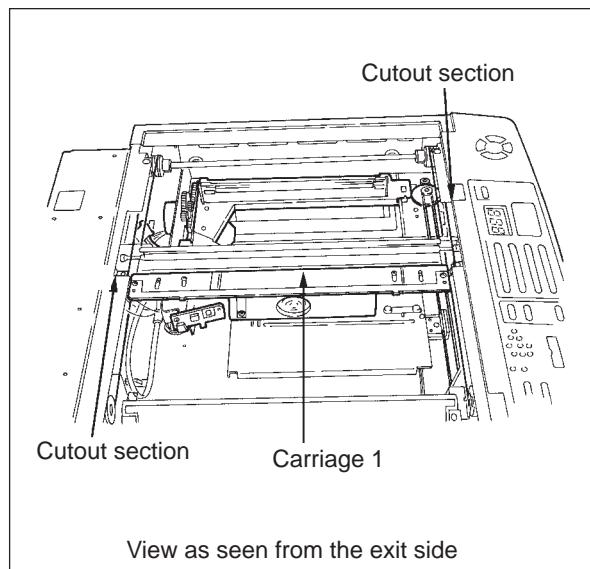
Lens switch:

- (1) Remove the original glass.
- (2) Move the lens unit to the feed side.
- (3) Raise the upper unit.
- (4) Remove the duct fan (1 screw).
- (5) Remove the switch by disengaging its claws.



7.3.6 Exposure lamp and thermofuse

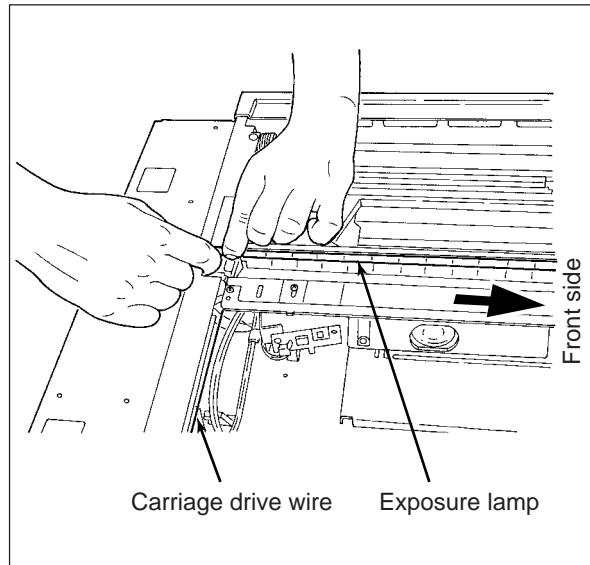
- (1) Remove the original glass.
- (2) Align carriage 1 with the cutout section of the frame.



Exposure lamp:

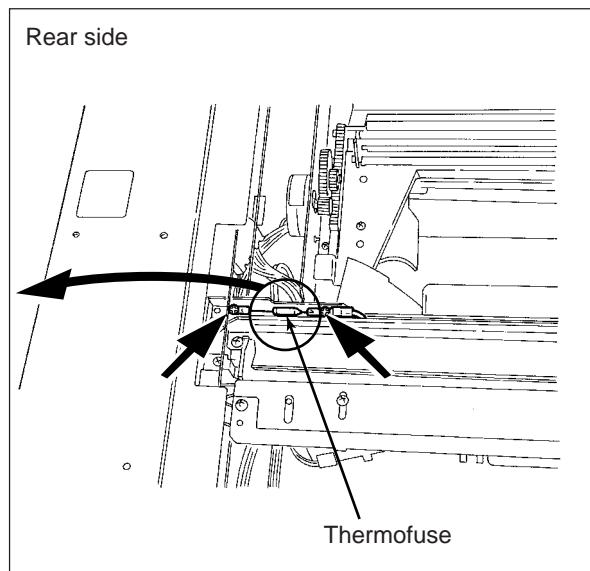
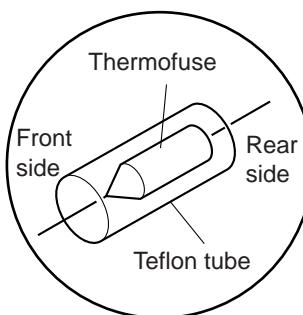
- (1) While pushing the lamp toward the front (→), disengage it from the supply blade.

Notes: 1. During replacement, don't touch the lamp surface with a bare hand.
2. Be careful not to allow the lamp to get scratched by the wire.



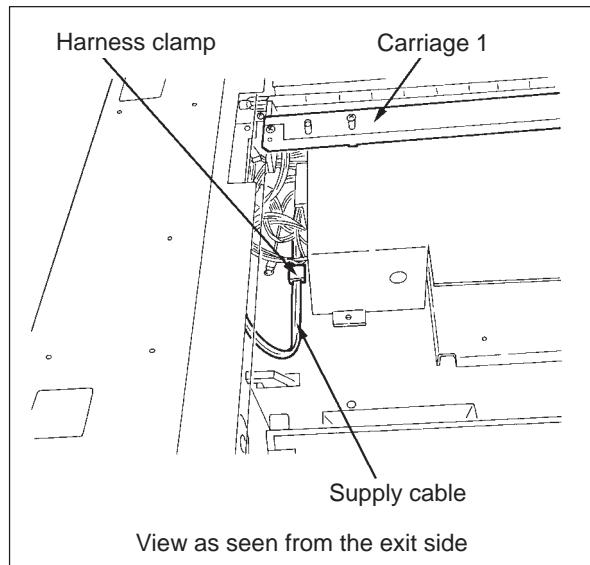
Thermofuse:

- (1) Remove two screws.

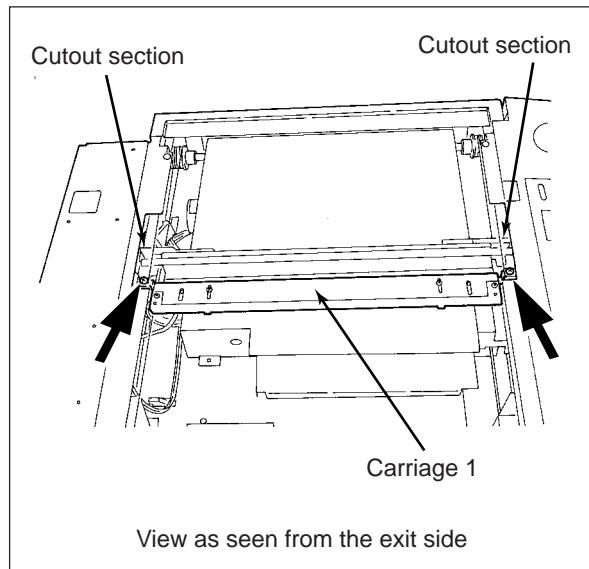


7.3.7 Carriage 1

- (1) Remove the supply cable's harness clamp and disconnect one connector.

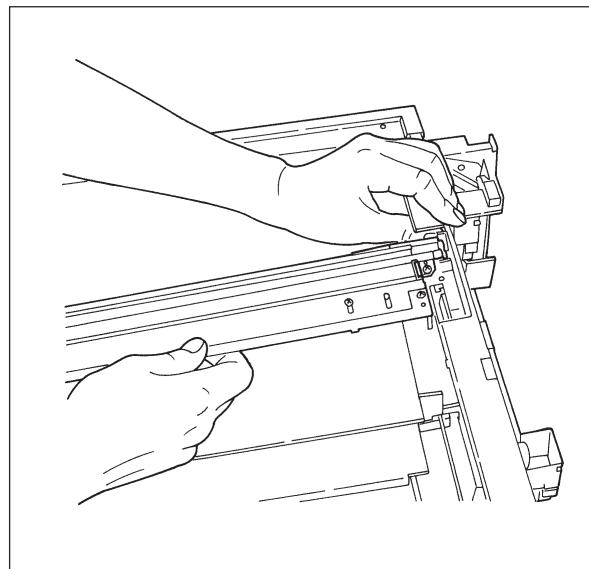


- (2) Move and align carriage 1 with the cutout section of the frame, then unhook the wire fixture (each screws for the front and rear).
- (3) Remove the power supply cable from the carriage 2's cable guide.



- (4) Slanting the whole carriage 1 unit, take it out upwards.

Note: Be careful not allow the unit to get hitched by the wire.

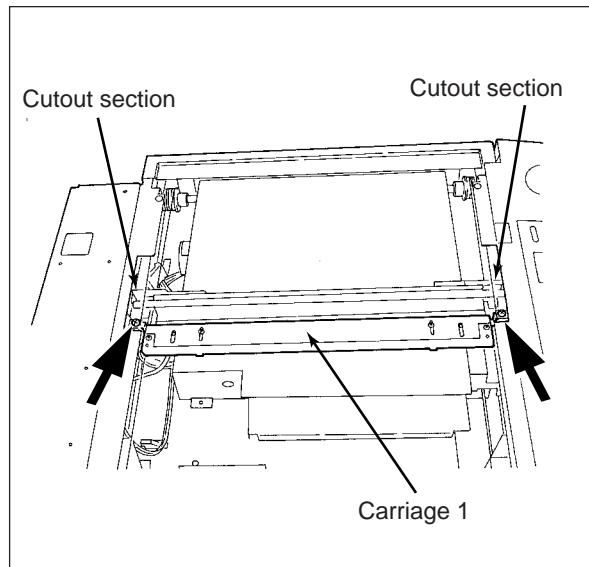


7.3.8 Carriage drive wire

The same procedure applies for removing the front and rear wires.

- (1) Remove the original glass, top cover, right-side cover (upper), left-side cover (upper), inner cover, and control panel.
- (2) Remove carriage 1 and the wire fixture (each screw for the front and rear).

Note: Be careful not to get hitched by the wire.

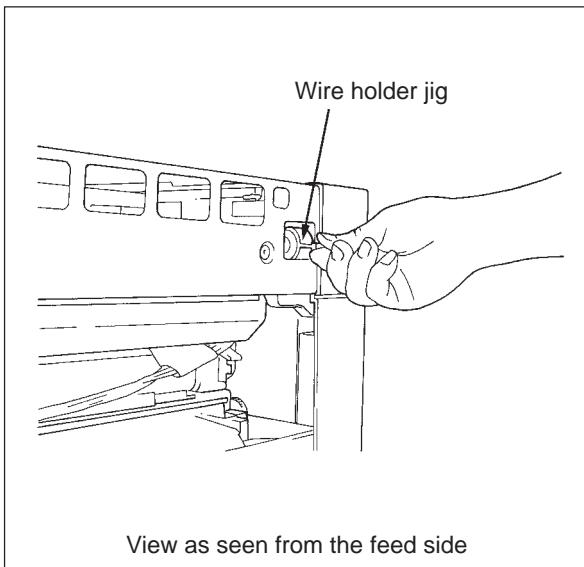


(3) Using the wire holder jig, fasten the wire on the shaft, so that it does not loosen
..... at both front and rear.

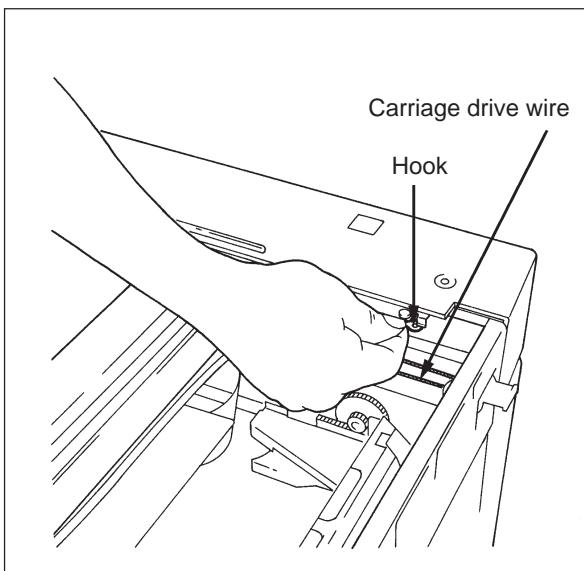
Note: The front side wire can be identified by its mark on the metal portion.

Front side wire : F

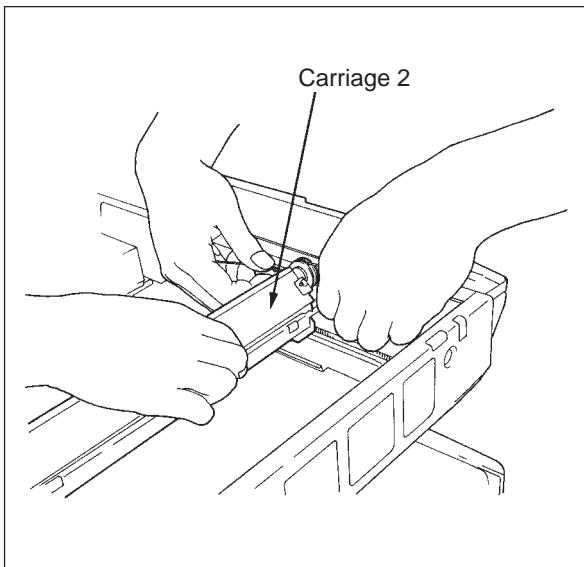
Rear side wire : R



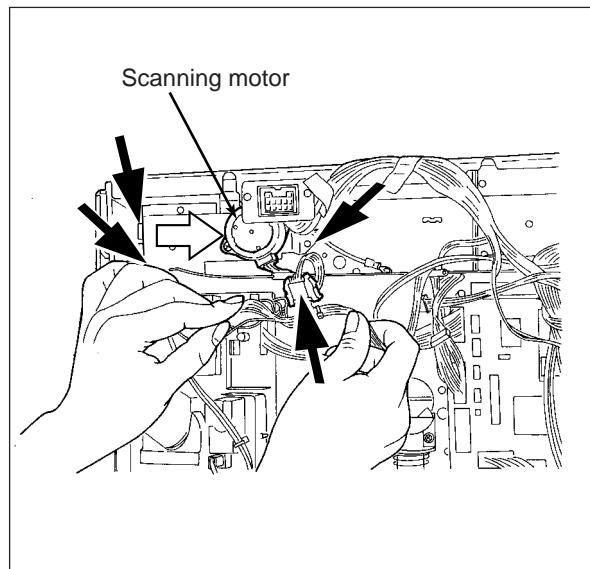
(4) After having loosened the wire tension adjustment screw, disengage the hook on the feed side
..... for both front and rear.



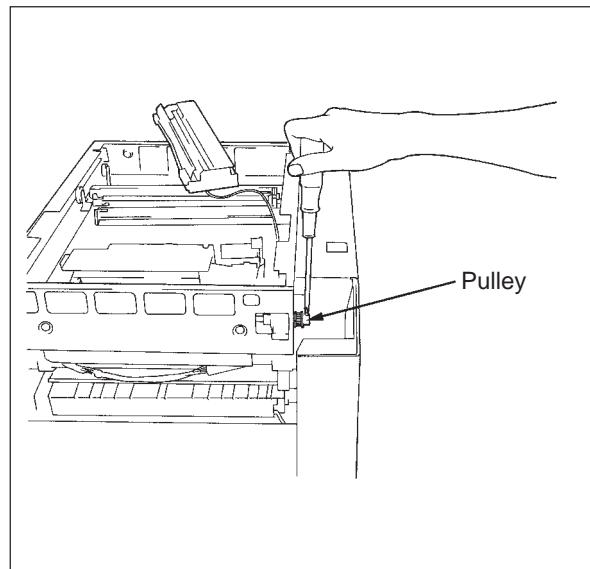
(5) Remove carriage 2.



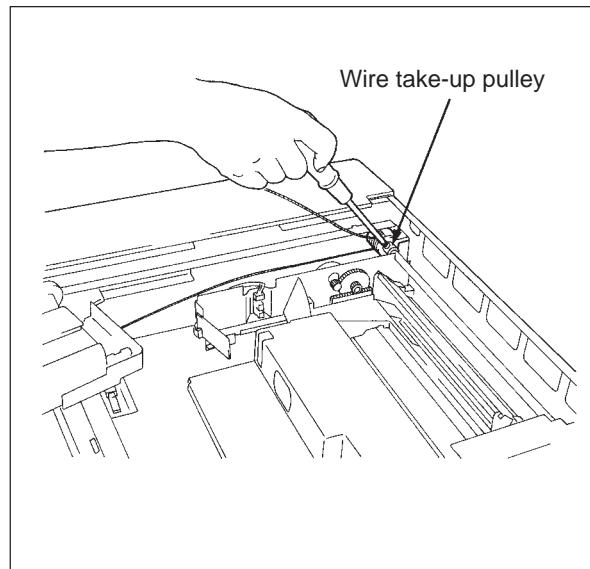
(6) Remove the scanning motor (3 screws).



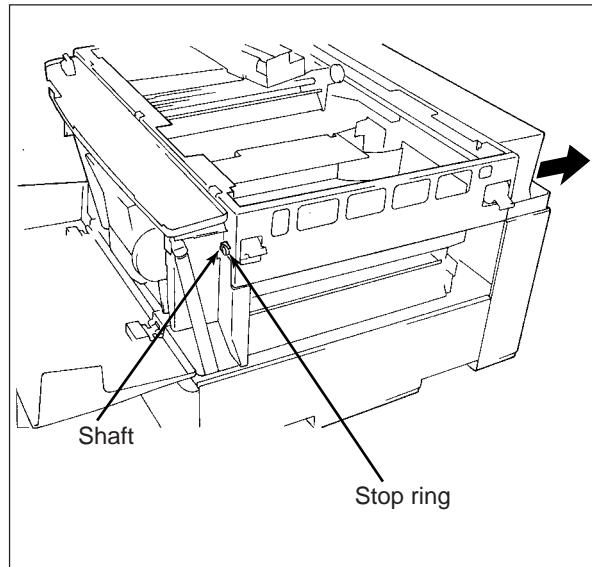
(7) Remove the pulley on the rear side (1 screw).



(8) Loosen the screw for the wire take-up pulley located inside the frame
..... for both front and rear.

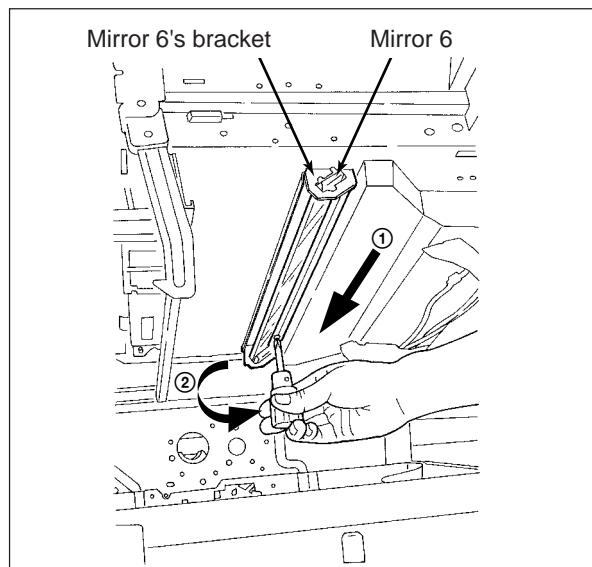


- (9) Remove the stop ring from the shaft (front).
- (10) Pull out the shaft from the rear.



7.3.9 Mirror 6

- (1) Remove the process unit.
- (2) Remove the mirror 6's cover (1 screw).
- (3) Remove the mirror 6's bracket (1 screw).
- (4) Move the mirror 6's bracket in the directions of arrows ① and ② and take out the bracket.

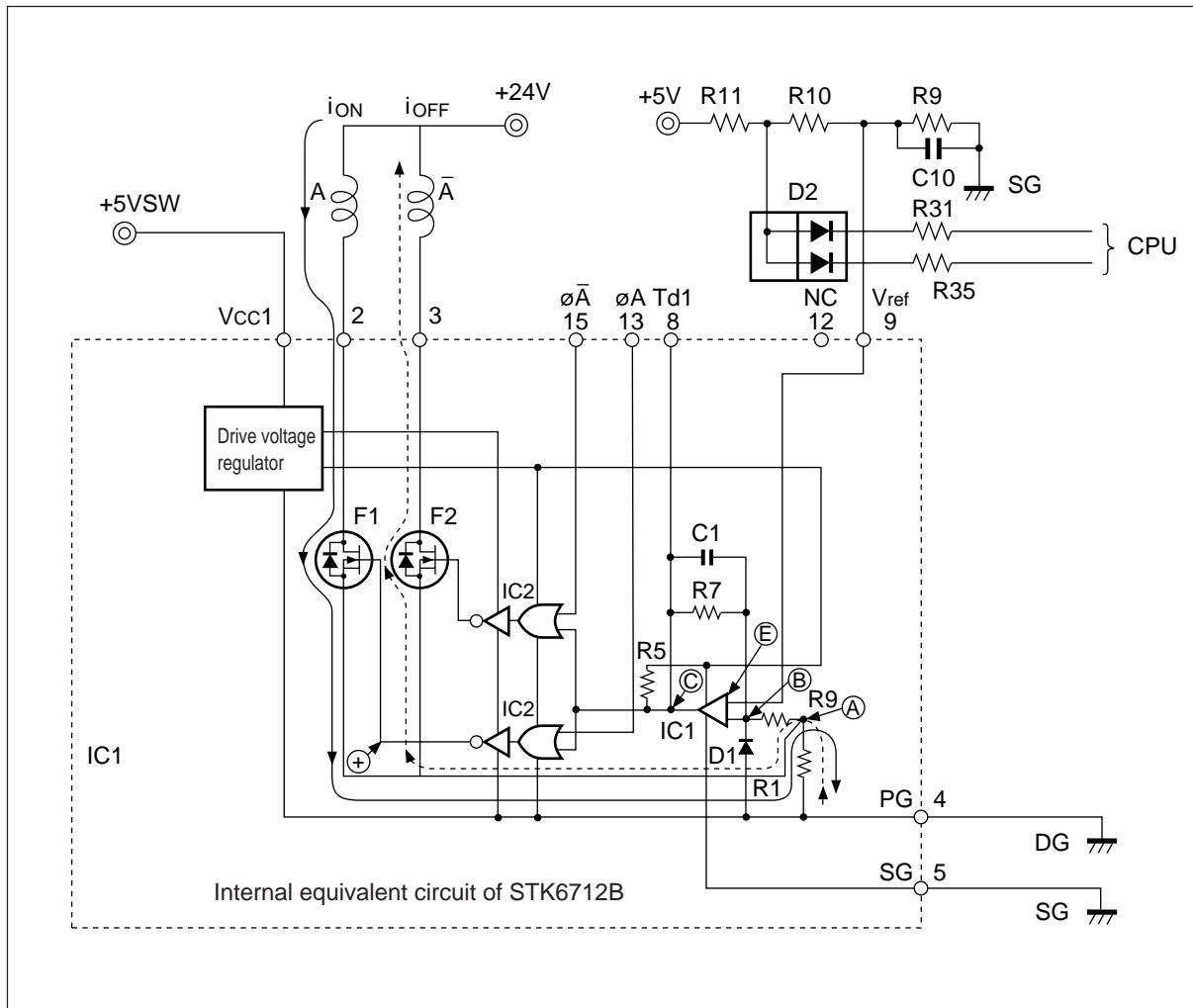


7.4 Pulse Motor

7.4.1 Pulse motor drive circuit (constant current type) (M2)

The scanning motor is driven by hybrid IC-STK6712BMK3 of the unipolar constant current chopper drive. The driving circuit for phase A and \bar{A} is shown below.

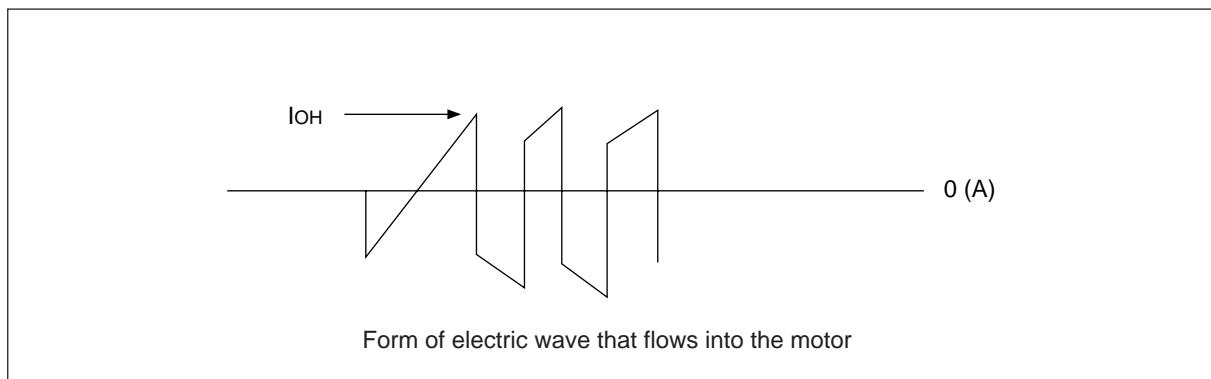
The same circuit is also used for the drive of phase B and phase \bar{B} .



The circuit composition in the IC consists of each phase excitation switching section (IC2), a driver (F1, F2), a comparator (IC1) and an electric current detection resistance (R11). The circuit operation in the case of excitation of phase A is described below:

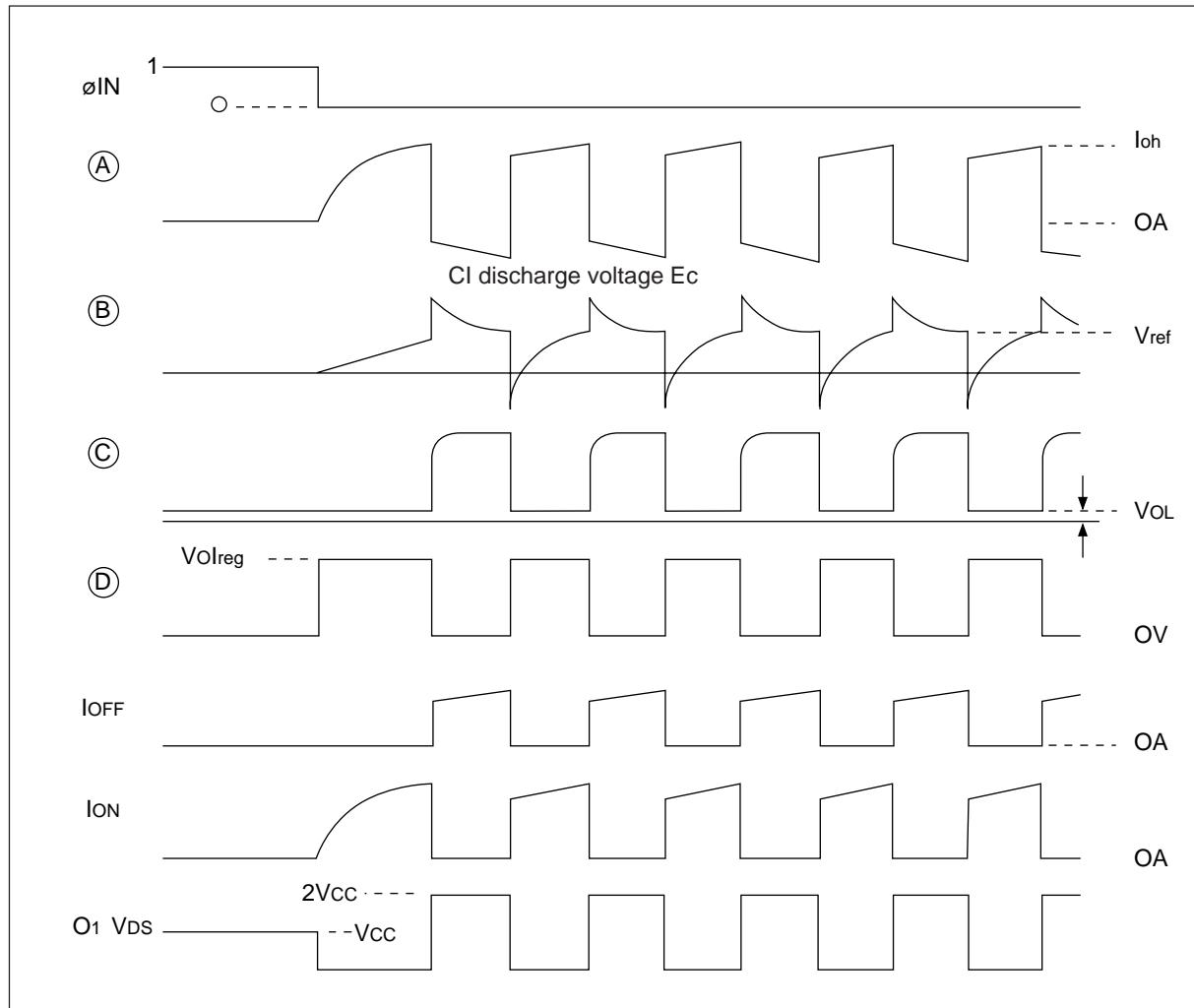
– Phase A excitation process –

- ① ϕA becomes “L” level ($\phi \bar{A}$ is “H” level).
- ② The reference voltage which is determined by a resistance type potential divider of R9, R10 and R11 is applied to reverse input ④ for comparator IC1 and non-reverse input ③ is “L”. Therefore, IC1’s output ⑤ becomes “L” level.
- ③ Due to ① and ② above, ④ of IC2 becomes “L” level and F1 becomes ON (conductive state).
- ④ Electric current flows to coil A from the +24 V power supply and increases gradually.
- ⑤ The terminal voltage of the electric current detection resistance R1 increases, and as the ③ voltage gets higher than ④ voltage, ⑤ becomes “H” level and F1 becomes OFF.
- ⑥ As coils \bar{A} and A are bipolar wound, the energy accumulated in coil A is induced into coil \bar{A} and discharged using coil \bar{A} . In other words the electric current flows in the direction of DG → R9 → F2 diode → coil \bar{A} .
- ⑦ The voltage accumulated in capacitor C1 decreases, and when it gets lower than ④ voltage, ⑤ goes to “L” level and F1 comes ON again to increase the phase A winding electric current.
- ⑧ The above ON/OFF operation (constant current chopping) of the electric current for the motor is repeated (refer to the diagram below).

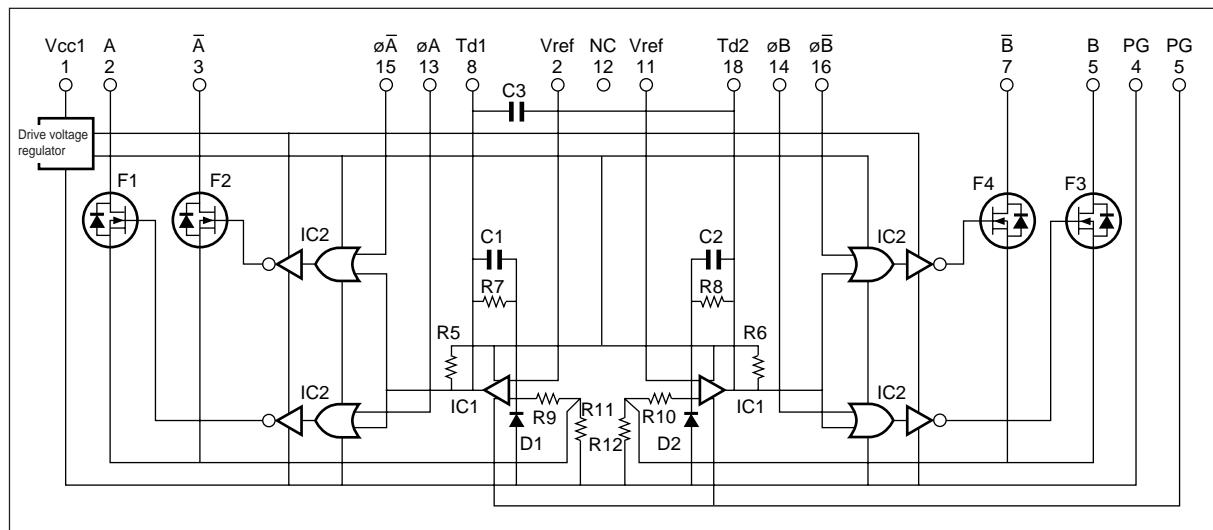


When exciting phase \bar{A} , phase $\phi \bar{A}$ becomes “L” level, while F2 becomes ON, and a similar operation is conducted.

Shown below is the waveform timing chart of each section:

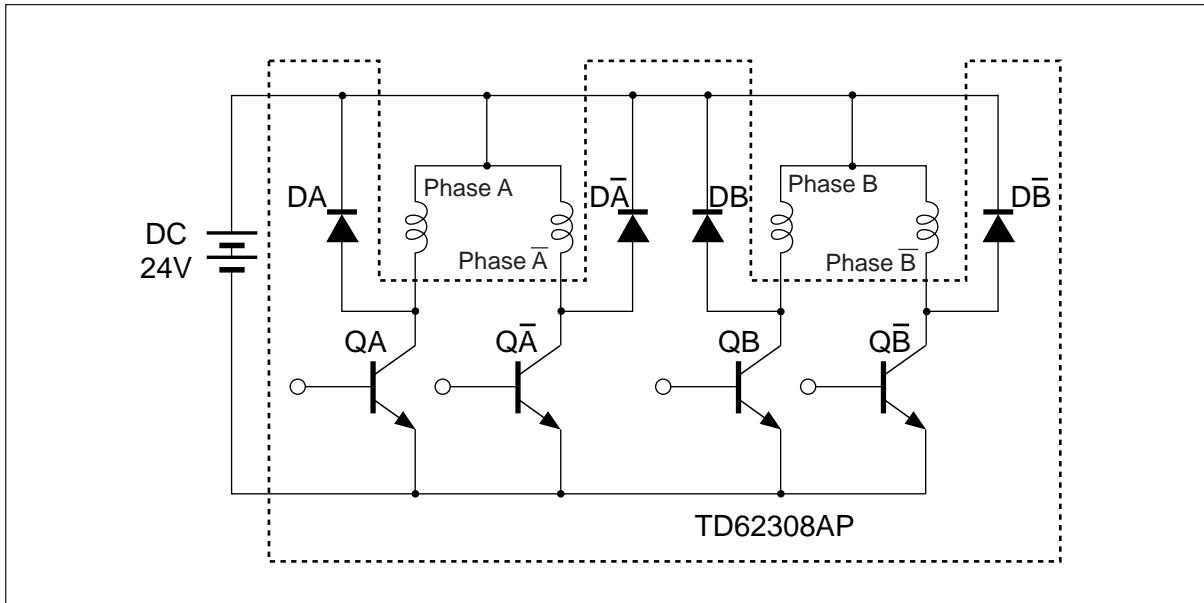


Equivalent circuit of STK6712B



7.4.2 Pulse motor dirve circuit (constant voltage type) (M3, M4)

{ Lens motor (M3) (LMS-MTR) ~Driven by IC5 (Logic PC board: TD62308F)
 { Mirror motor (M4) (MRR-MTR) ~Driven by IC4 (Logic PC board: TD62308F)



The diagram on the right shows signals impressed to QA , QB , QA , and QB bases in two-phase excitation.

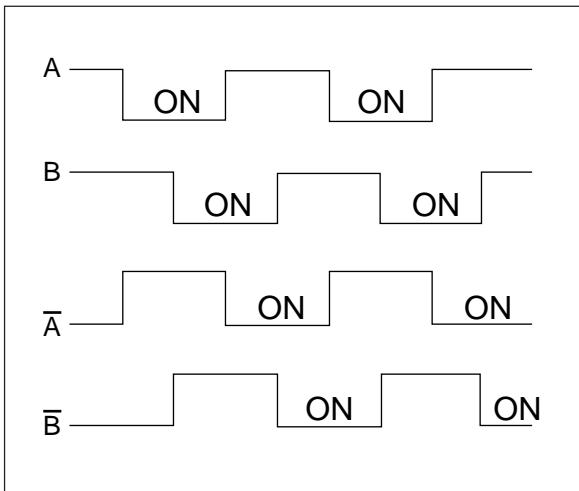
The ON/OFF combination of the transistor is switched.

↓

The combination of phases to which the current flows is switched.

↓

Motor rotates



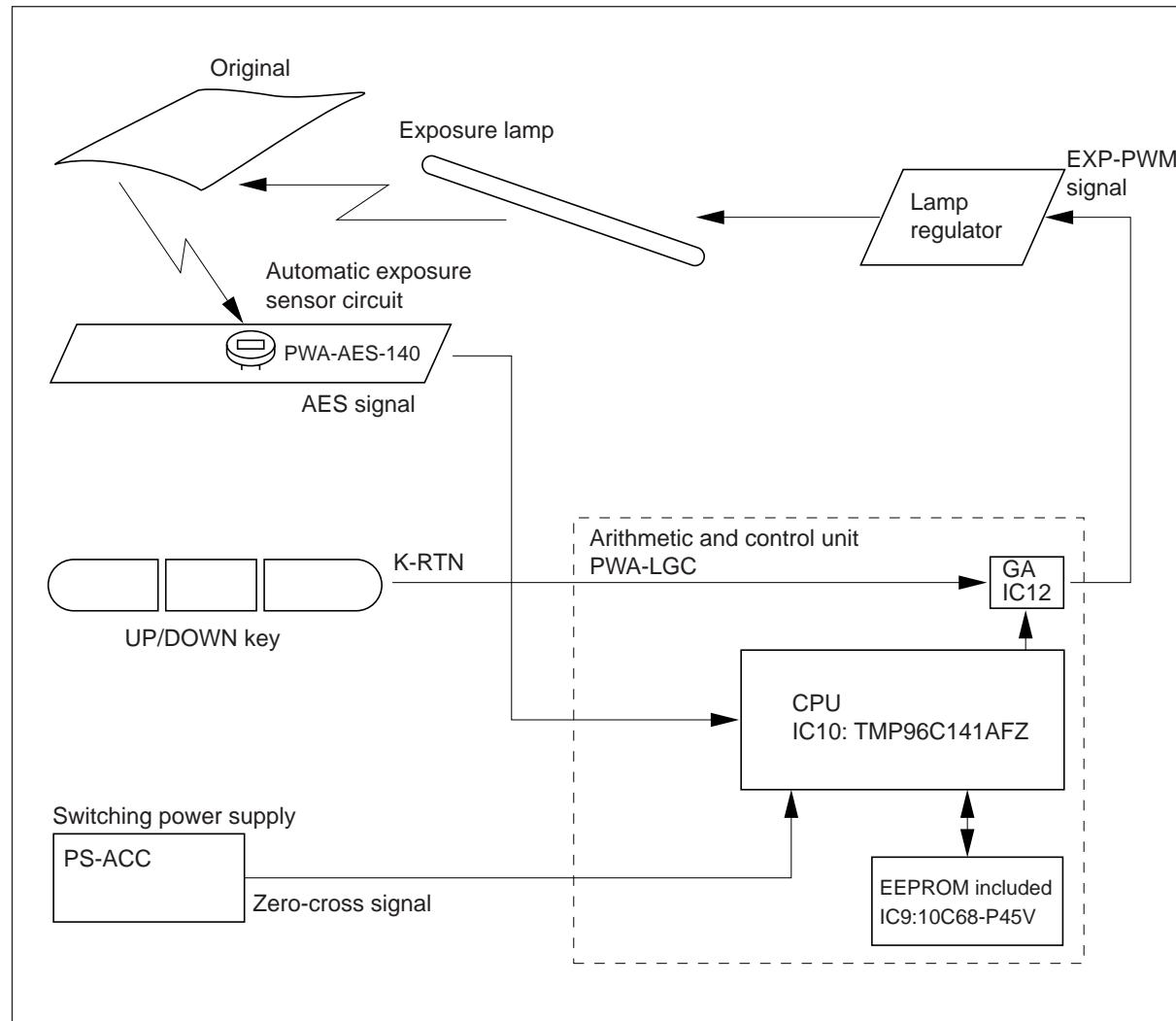
7.5 Exposure Control Circuit

(1) Brief description

The exposure control circuit is composed of the following four blocks.

- ① Lamp regulator Impresses a voltage corresponding to the duty ratio of the EXP-PWM signal upon the exposure lamp.
- ② Automatic exposure sensor circuit Generates an AES signal indicating the density of the original by sensing the light reflected by the surface of the document.
- ③ Arithmetic and control unit Determines the lamp voltage by computation on the basis of AES and K-RTN signals, etc., and outputs the EXP-PWM signal to the lamp regulator.

***Note:** The ON/OFF state of the exposure lamp is controlled by a special signal (EXPON), which is different from the EXP-PWM signal.

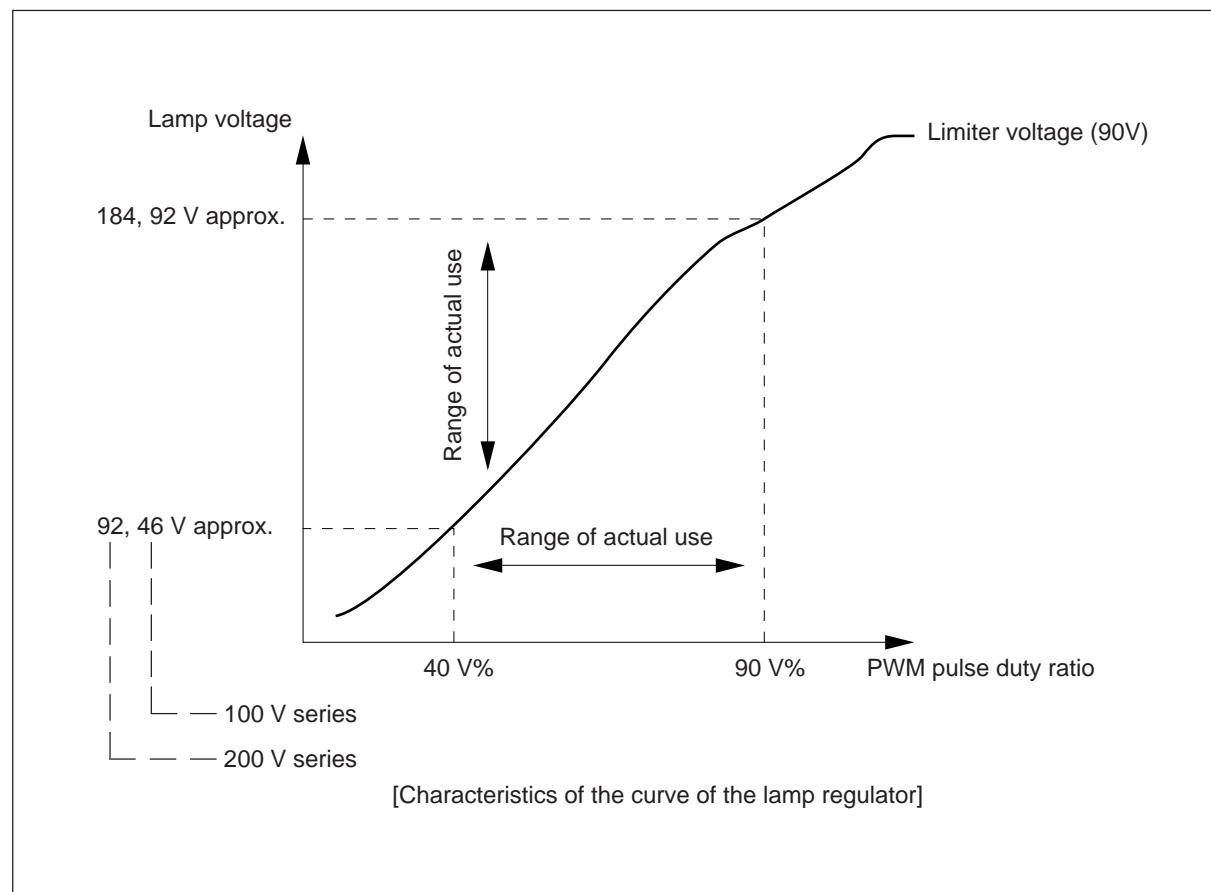


The exposure control circuit has the following two functions:

- Ⓐ Manual exposure mode Impresses a constant lamp voltage corresponding to the setting by the UP/DOWN keys on the exposure lamp.
- Ⓑ Automatic exposure mode The quantity of light reflected by the surface of the original, which varies according to its lightness and darkness, is detected by the automatic exposure sensor circuit, and the voltage impressed on the exposure lamp is varied accordingly; a high lamp voltage being impressed when the original is dark and a low lamp voltage when it is light.

(2) Function of lamp regulator

A typical characteristic curve is shown below. By means of a phase-angle control system, it is controlled so that a lamp voltage corresponding to EXP-PWM pulse duty ratio input is generated even when some fluctuation occurs in the AC input voltage.



(3) Automatic exposure sensor circuit (PWA-F-AES-140)

Through the action of IC1, the incidence of light upon protocell PD1 generates an AES signal on J3-6.

Dim reflected light → Small AES output

Intense reflected light → Large AES output

(4) Arithmetic and control unit

The arithmetic and control unit is composed of the following two blocks.

① EEPROM built-in SRAM Consists of IC9 (STK10C68), which stores exposure adjustment data to ensure that optimal exposure is performed for each reproduction ratio and for automatic exposure.

② CPU (IC10)..... Incorporates software which computes the voltage to be impressed on the lamp in accordance with such copying modes as photographic magnification, automatic exposure, and manual exposure, as well as adjustment data inside the SRAM.

7.6 Lamp Regulator Circuit

The lamp regulator performs control to maintain the amount of light of the exposure lamp at a constant value by monitoring the AC input voltage.

(Method) • Detects the AC input voltage.

↓

• Changes the input voltage to a DC voltage approximate to its effective value by means of the waveform shaping circuit.

↓

• This DC voltage is compared with the reference voltage made by shaping the pulse signal and is amplified.

↓

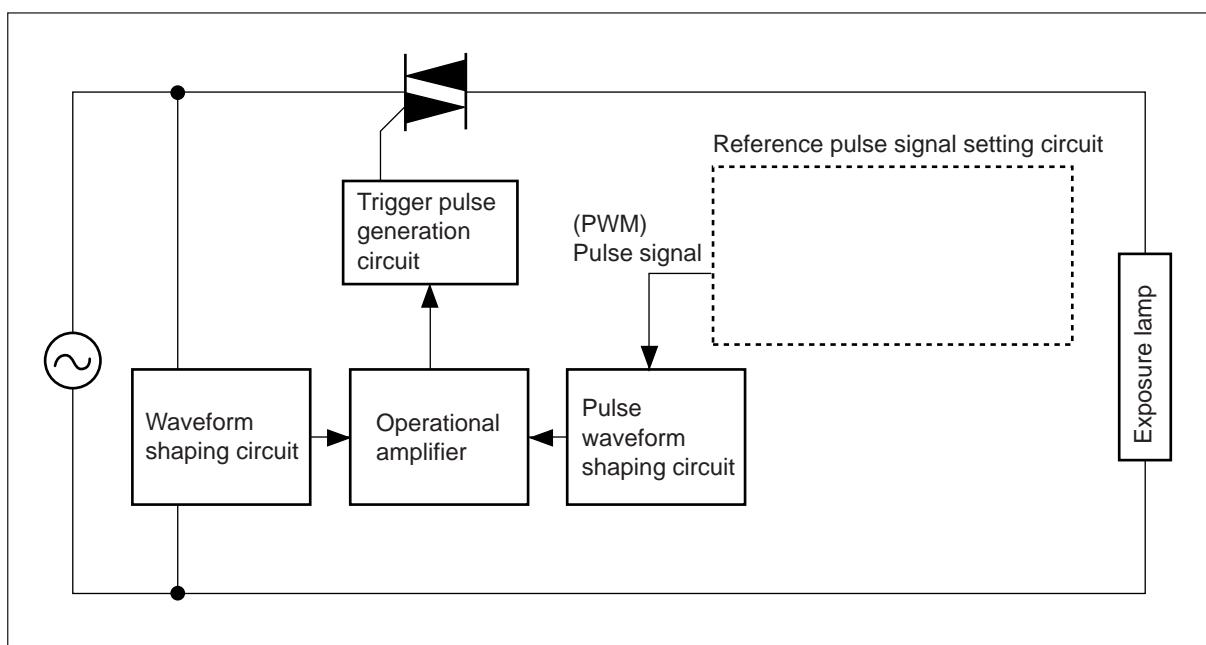
• Based on the reference voltage and the input voltage, the trigger pulse generation circuit generates trigger pulses in synchronism with the frequency of the power supply.

↓

• Controls the conduction angle of the triac.

||

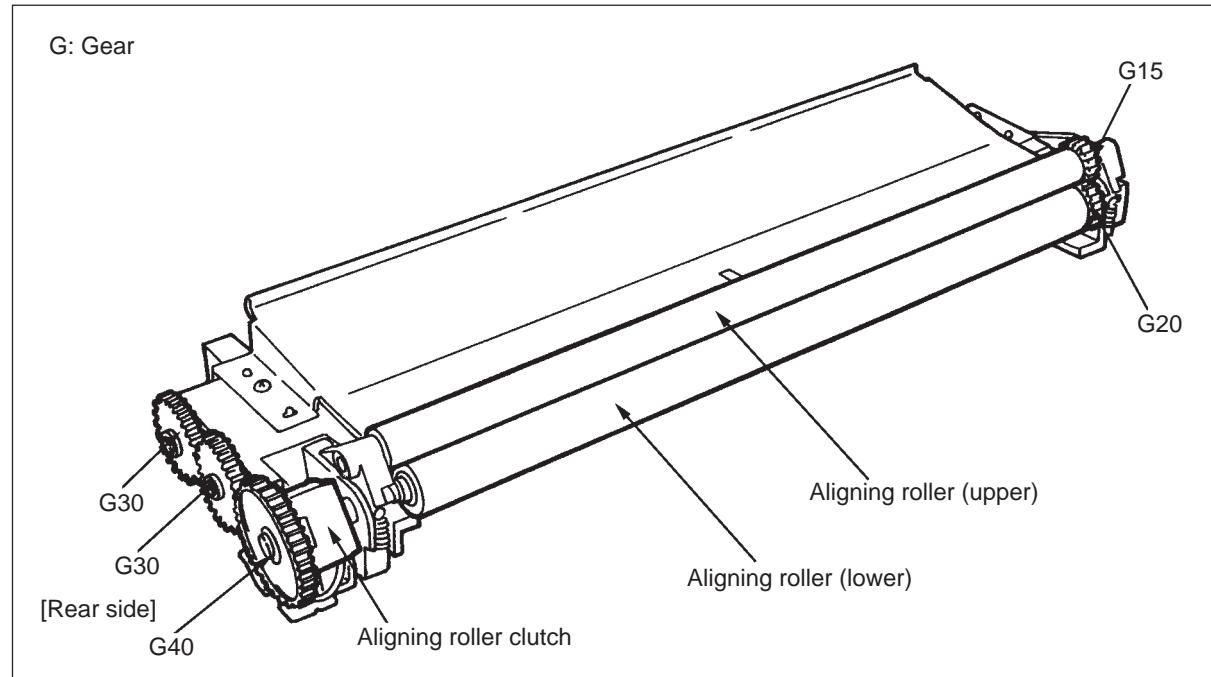
The voltage applied across the lamp is kept consistent.



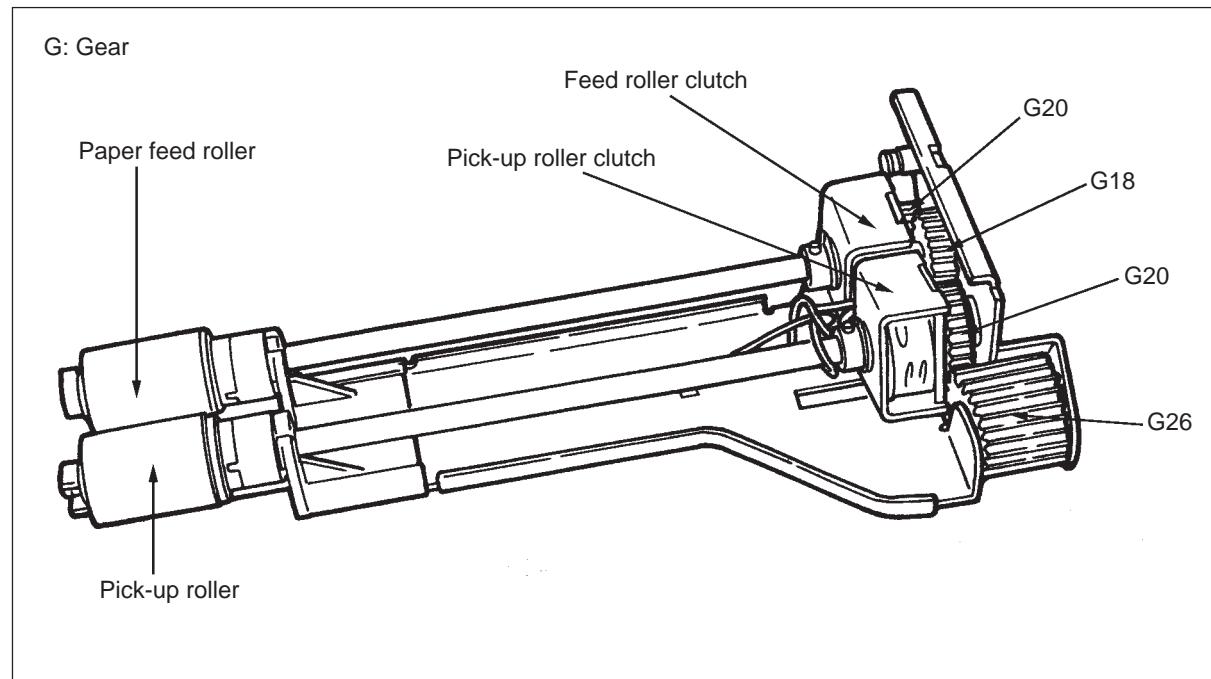
8. FEEDER UNIT

8.1 Construction

The paper feeder unit consists of upper and lower paper feeder units.



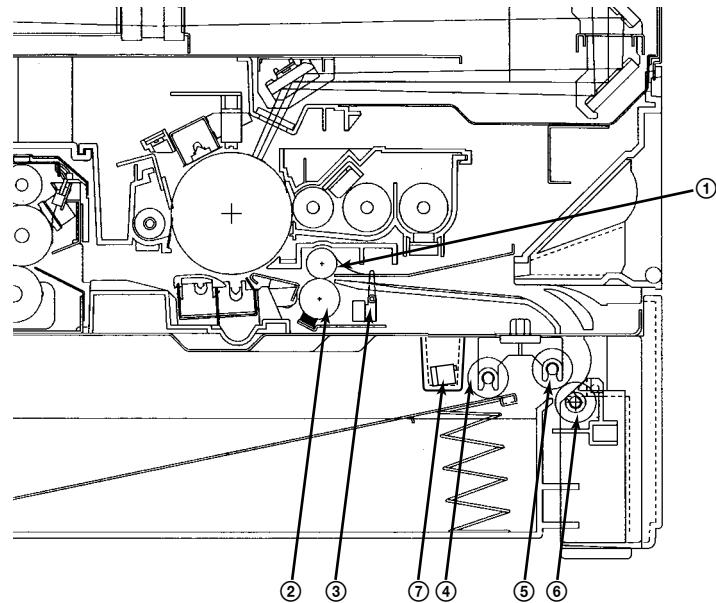
Upper paper feeder unit



Lower paper feeder unit turned upside down

8.2 Explanation of Operation

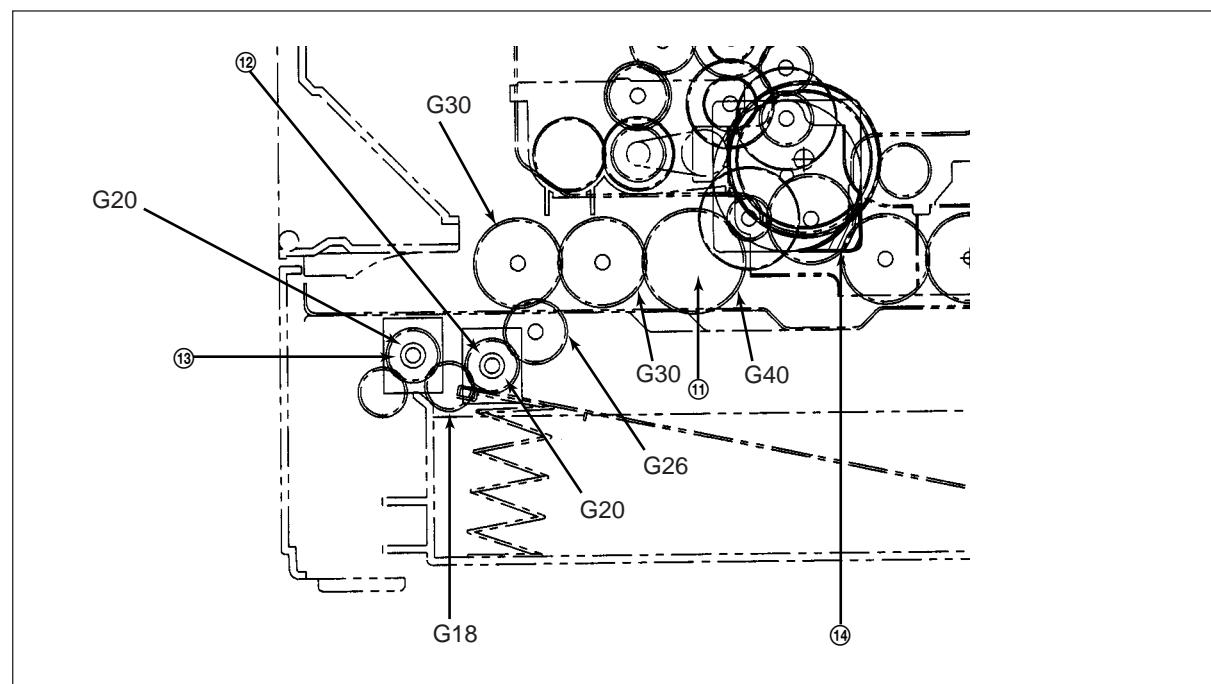
8.2.1 Paper feeding operation



- ① Aligning roller (upper)
- ④ Pick-up roller
- ⑦ Paper empty switch

- ② Aligning roller (lower)
- ⑤ Paper feed roller

- ③ Aligning switch
- ⑥ Separation roller



- ⑪ Aligning roller clutch
- ⑬ Feed roller clutch

- ⑫ Pick-up roller clutch
- ⑭ Main motor

(A) Manual feeding operation

- Paper manually inserted pushes the aligning switch ③.
- When the PRINT key is pressed, the main motor starts rotating and the aligning roller clutch ⑪ is energized, causing the paper to be sent to the transfer process.

(B) Cassette feeding operation

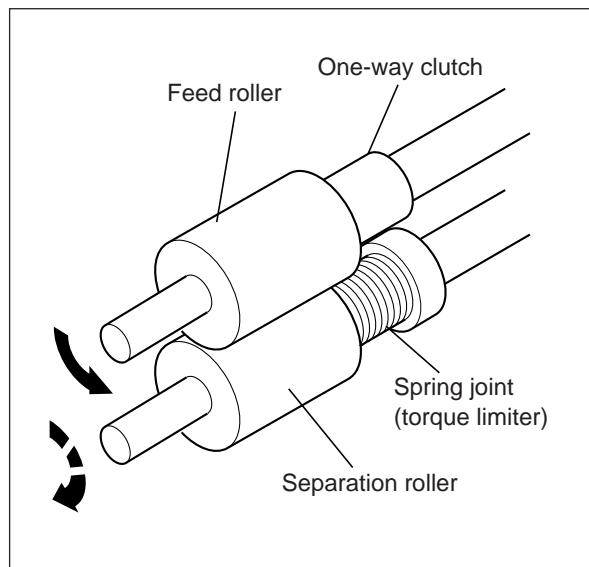
- Electromagnetic clutches (feed roller clutch and pick-up roller clutch) are energized to rotate the pick-up roller ④ and feed roller ⑤, starting paper feeding.
- Electromagnetic clutch ⑫ for the pick-up roller is de-energized, with the paper left pushing the aligning switch ③.
- The paper is aligned by the aligning rollers ① and ②, the electromagnetic clutch ⑬ for the feed roller is de-energized, the aligning roller clutch ⑪ comes ON, then the paper is sent to the transfer process.

8.2.2 Paper separation operation

Since no paper separation claws are used in the cassette, a paper separation roller is installed inside the machine. The separation roller section consists of a paper feed roller, one-way clutch, separation roller spring joint, etc., as shown.

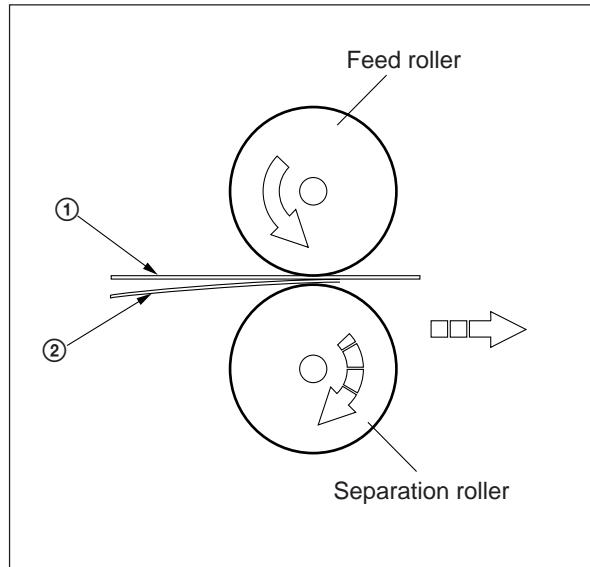
The feed roller is equipped with a weight and rotates in the direction of the arrow (↗) at the same timing with the pick-up roller.

The separation roller shaft, equipped with a torque limiter based on a spring joint, is designed to rotate in the direction of the arrow (↘) and transmits its rotation to the separation roller through the spring joint.



For example, when only one sheet of paper ① is sent to the separation area, since the feed roller's transporting force is stronger, the separation roller is forced to rotate in the direction of the arrow (↗), causing the sheet to be sent toward the aligning roller.

If, as shown, two sheets are fed at the same time, since the friction between the sheets is smaller, the lower sheet is stopped being fed any further while the upper sheet is forced to be transported by the feed roller in the direction of the arrow (→).

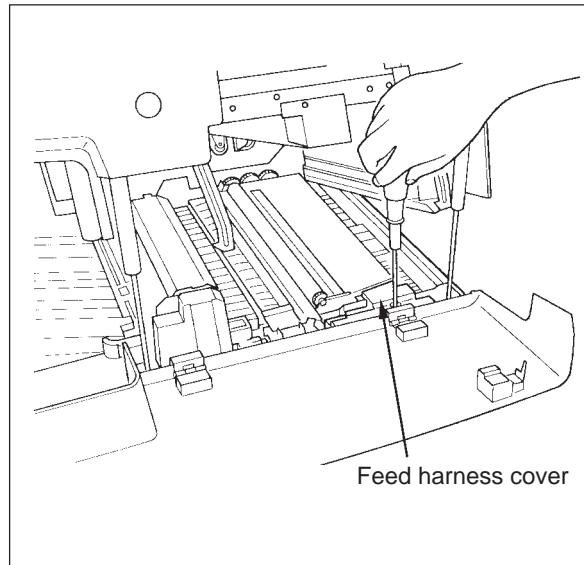


8.3 Disassembly and Replacement

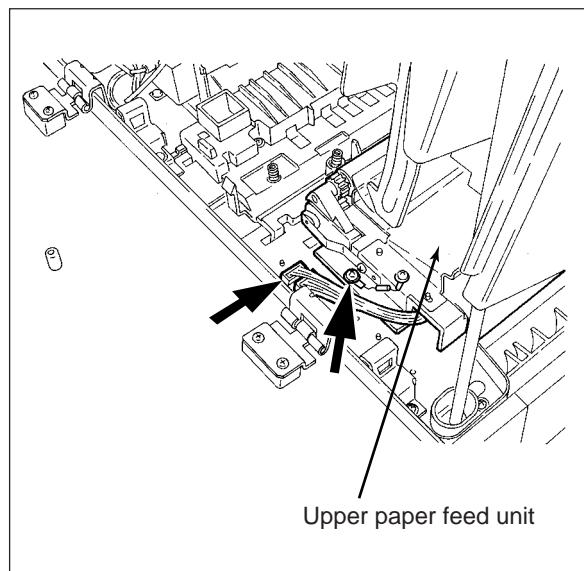
Depending upon the locations of the parts to be disassembled or replaced, covers should be removed or the upper unit should be opened as required.

8.3.1. Upper paper feed unit

- (1) Remove the transfer/separation charger unit.
- (2) Remove the feed harness cover (1 screw).

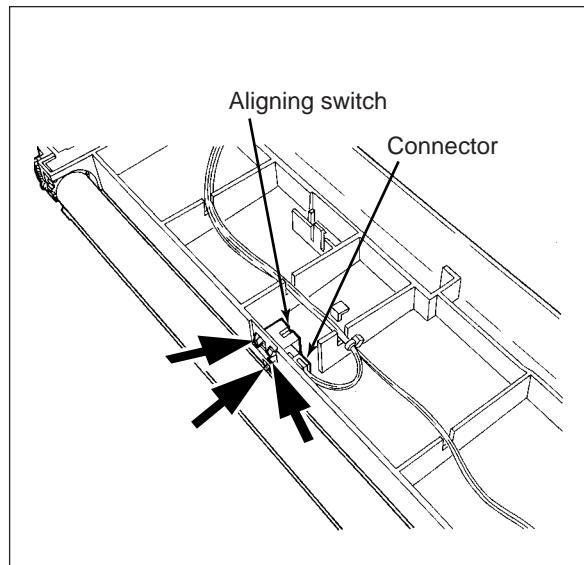


- (3) After removing one screw and disconnecting one connector, pull the unit out to the front and lift it out.



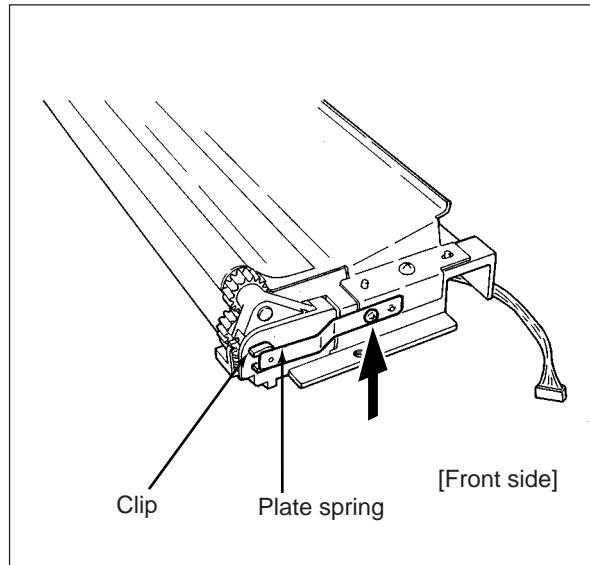
Aligning switch:

- (1) Place the upper paper feed unit upside down.
- (2) Remove the paper dust brush.
- (3) Disengage three claws and disconnect one connector.

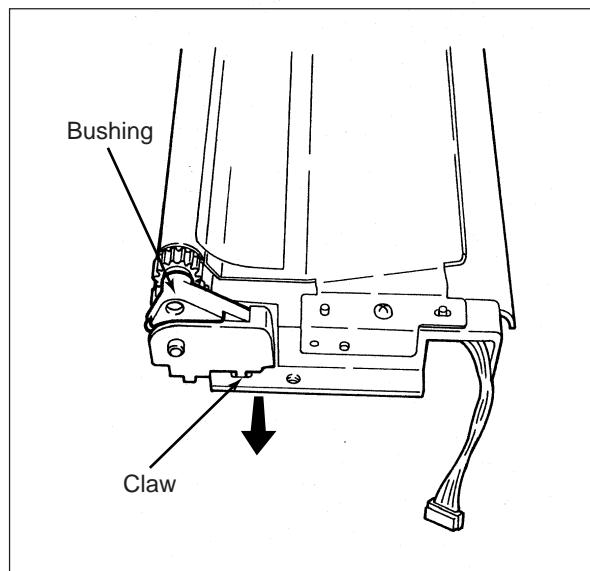


Clutch and aligning rollers (upper/lower):

- (1) Remove the plate spring (1 screw).
- (2) Snap off the clip.

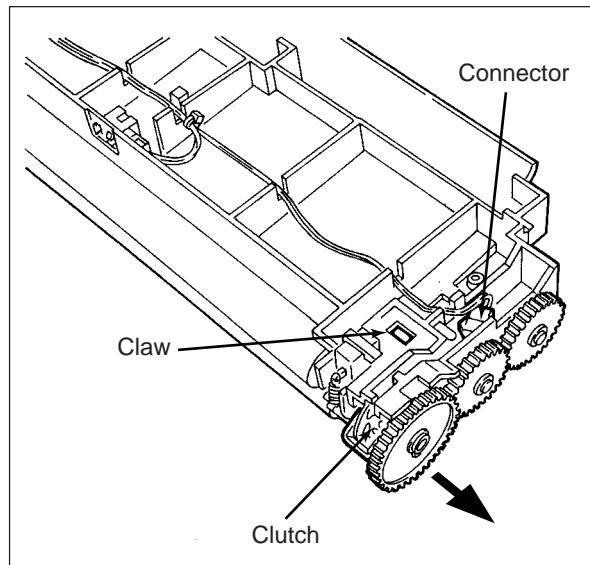


- (3) While pushing down the claw, pull out the bushing toward the front.

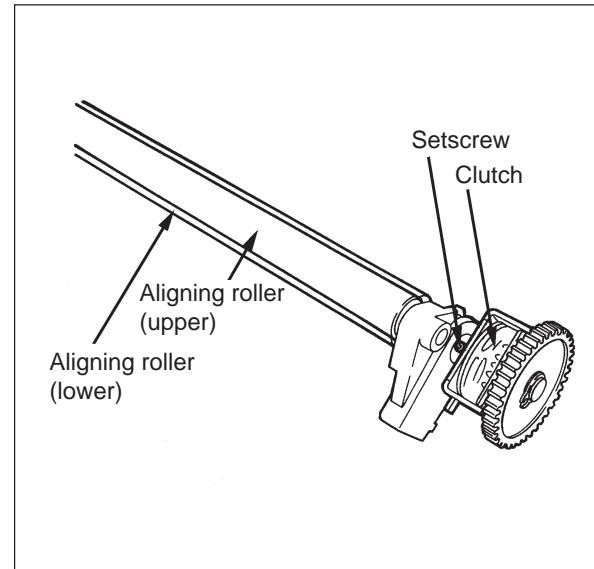


- (4) Disconnect one connector.

- (5) While pushing down the rear claw, pull out the bushing toward the rear.

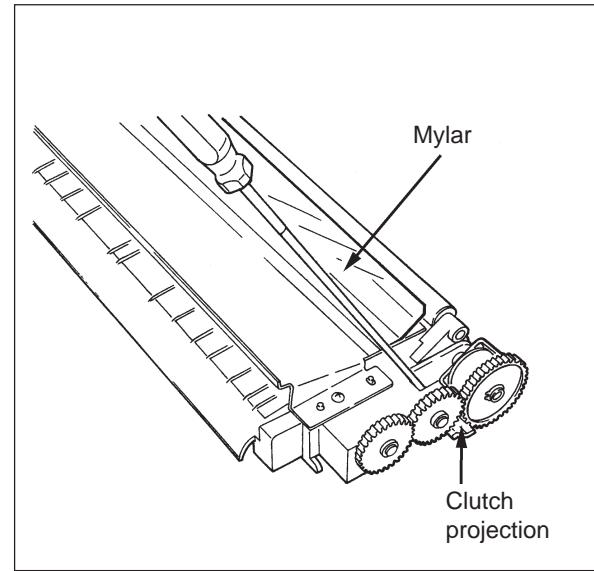


(6) Removing one setscrew allows the clutch and the aligning roller (lower) to be disassembled, respectively. Also, the aligning roller (upper) can be removed.



Notes:

1. During disassembly, be careful not to damage the mylar.
2. Pay attention to the orientation of the clutch projection.



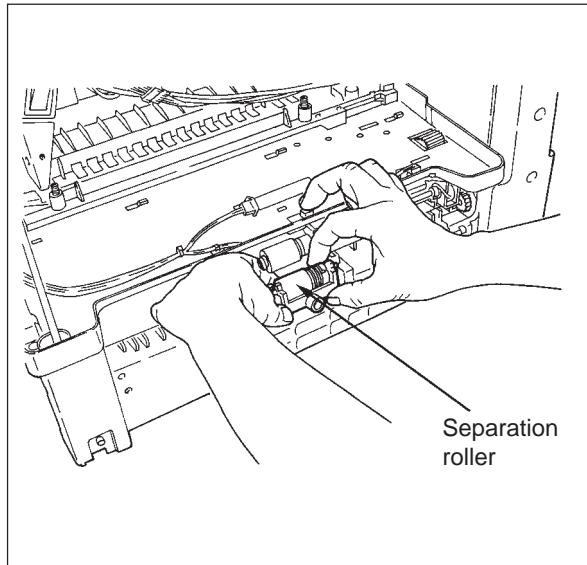
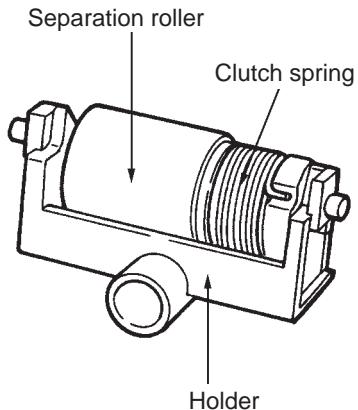
8.3.2 Lower paper feed unit

- (1) Pull out the cassette.
- (2) Remove the upper paper feed unit.
- (3) Remove the feed side cover and right side covers (lower, upper).

Note: Be careful not to lose the spring.

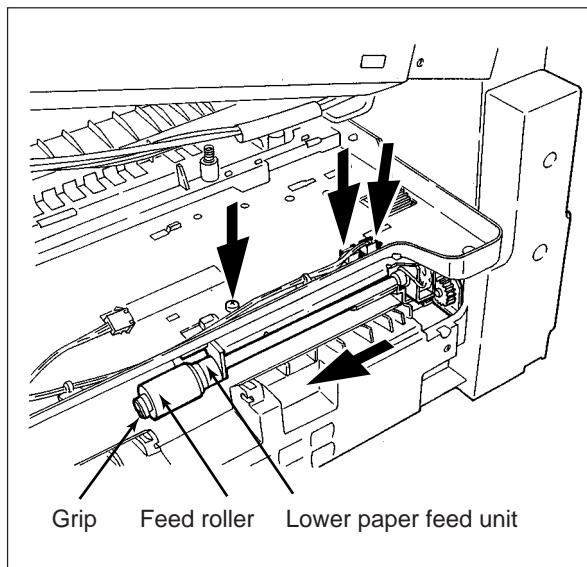
- (4) Remove the separation roller.

The roller unit can be removed by pulling it toward you.



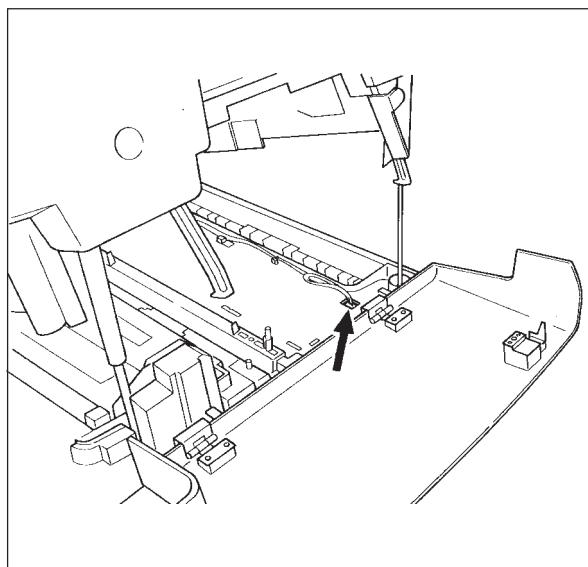
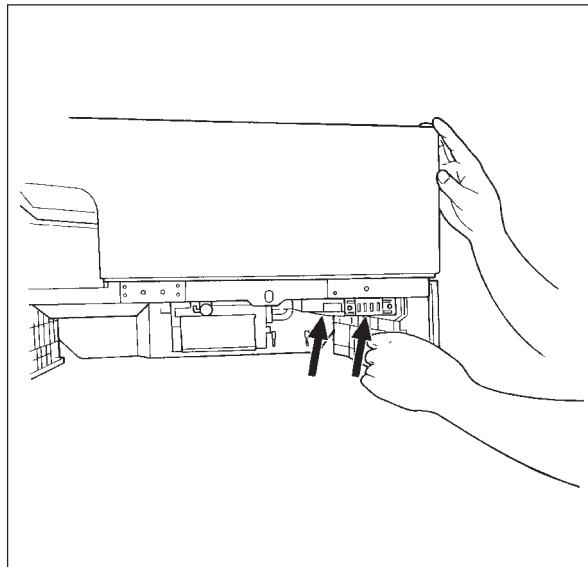
- (5) Disconnect two connectors and remove one screw. Slide the whole unit toward the front, then lower it and pull it out toward you.

Note that the feed roller can be removed without taking out the whole unit. Just remove the grip and pull out the roller from its shaft.



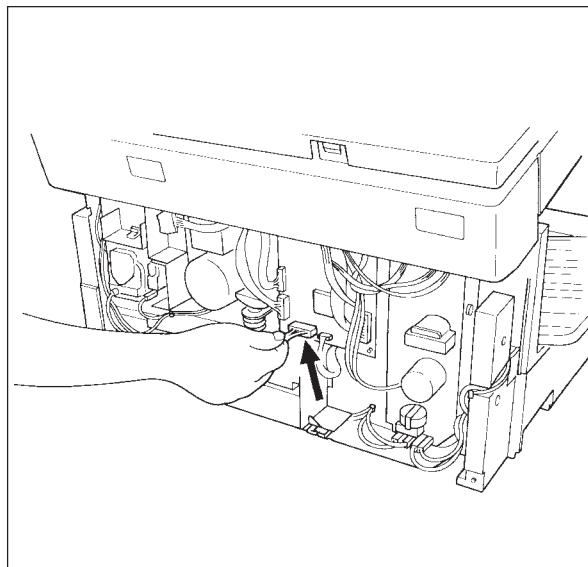
Empty switch:

- Remove the rail unit (2 screws and a connector).

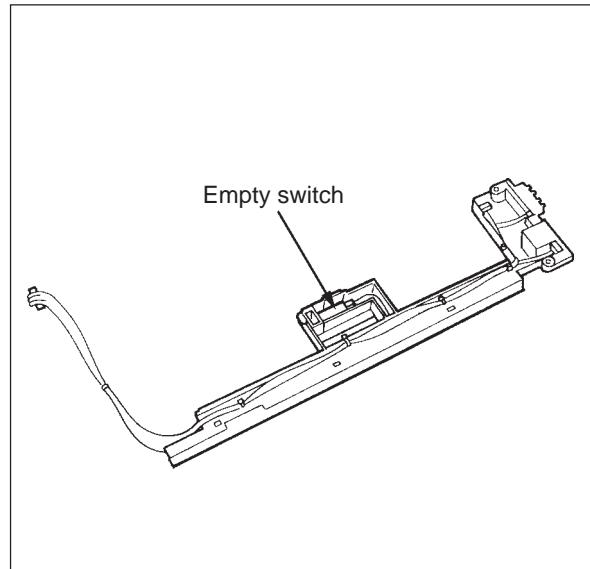


- Slide the rail unit toward the front and lower it to remove.
- Remove the rear cover and disconnect one connector from the logic PC board.

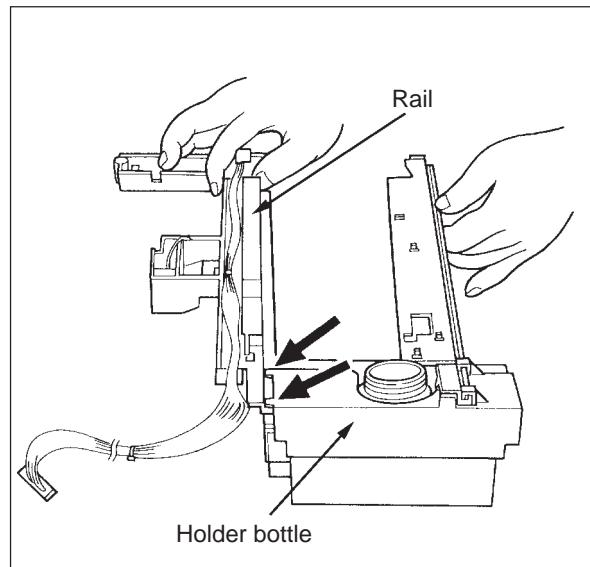
Take the connector out through the window in the rear frame to the front side.

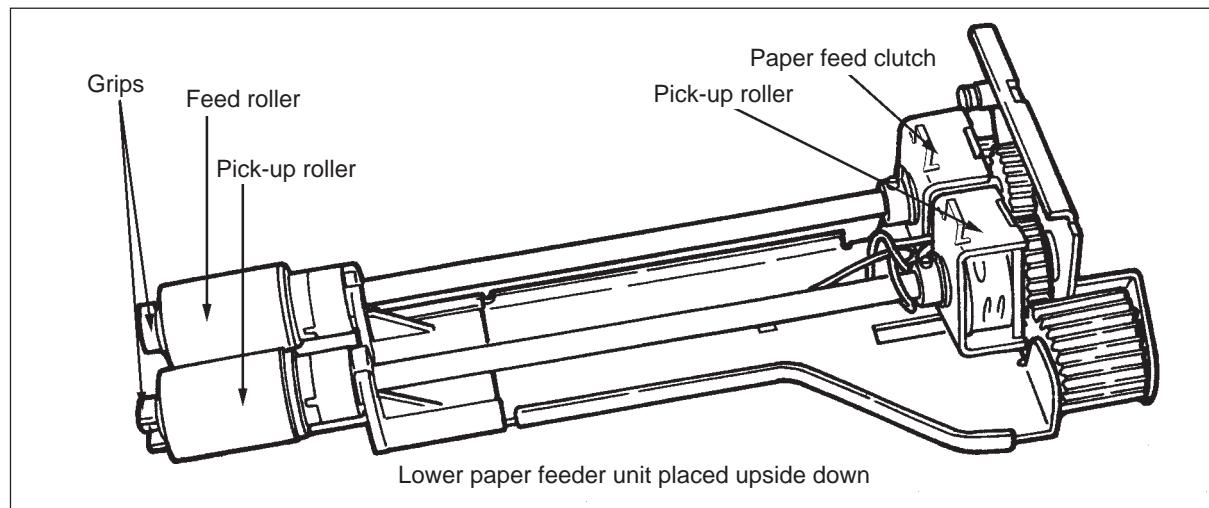


- After pulling out the whole unit to the front side, remove one claw and raising the switch, disconnect the connector.



Note: When reassembling the rail unit, make sure that the holder bottle is placed on the rail.



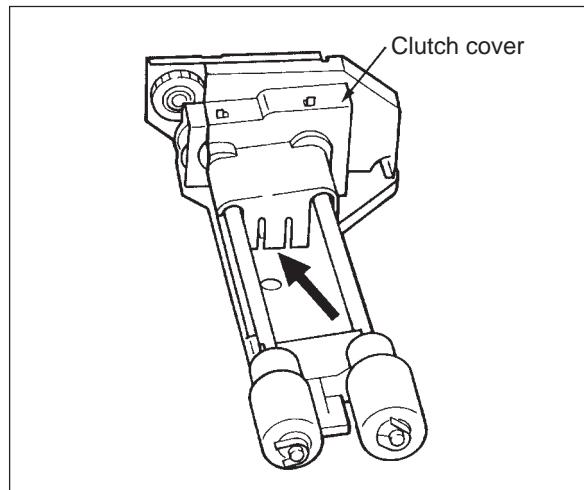


Pick-up roller and feed roller:

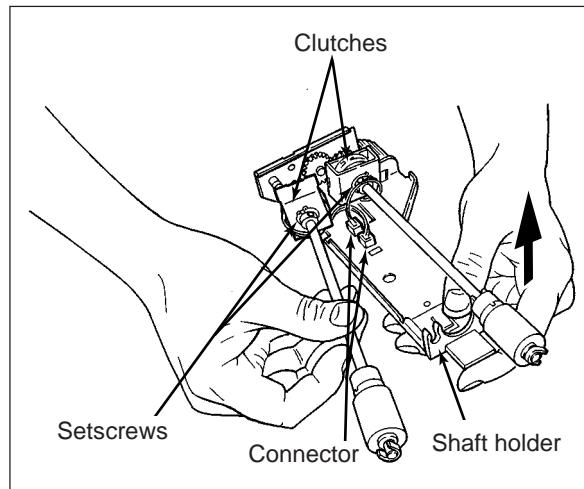
- Snap off the grips and pull out each roller from its shaft. Note that the pick-up roller and the feed roller are the same parts.

Pick-up roller clutch and feed roller clutch:

- Disengage one claw to remove the clutch cover.

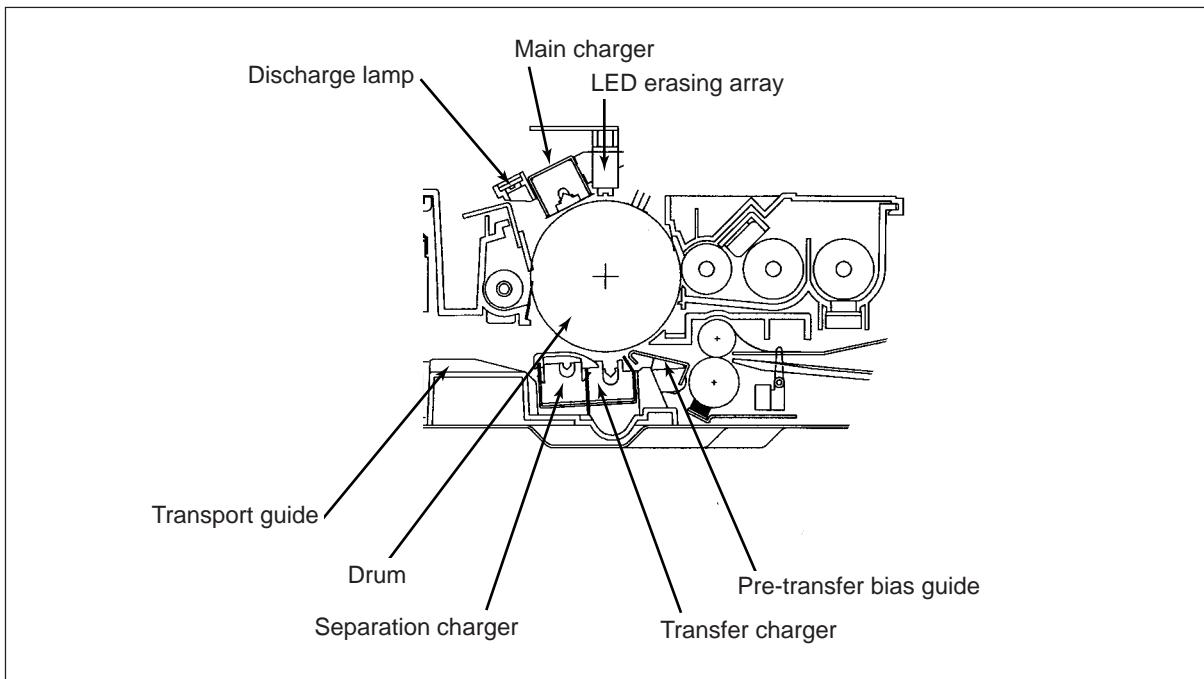


- While lifting each shaft in the direction of the arrow, remove each clutch from the shaft holder.
- Disconnect the connector from the bracket.
- Removing one setscrew allows the clutch and the shaft to be separated.
- The pick-up roller clutch and the feed roller clutch are the same parts.



9. DRUM-RELATED SECTION

9.1 Construction



- Process unit
 - LED erasing array
 - Discharge lamp
 - Main charger
 - Drum
- Lower unit
 - Transfer/separation charger
 - Pre-transfer bias guide
 - Transfer guide

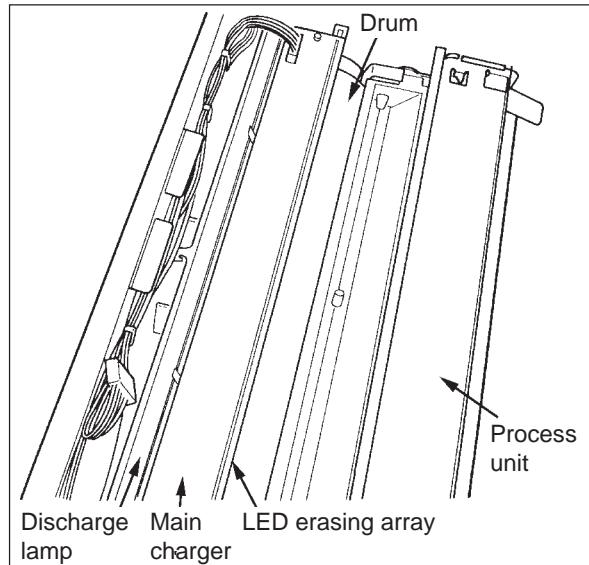
Charging unit

High-voltage transformer

9.2 Explanation of Functions

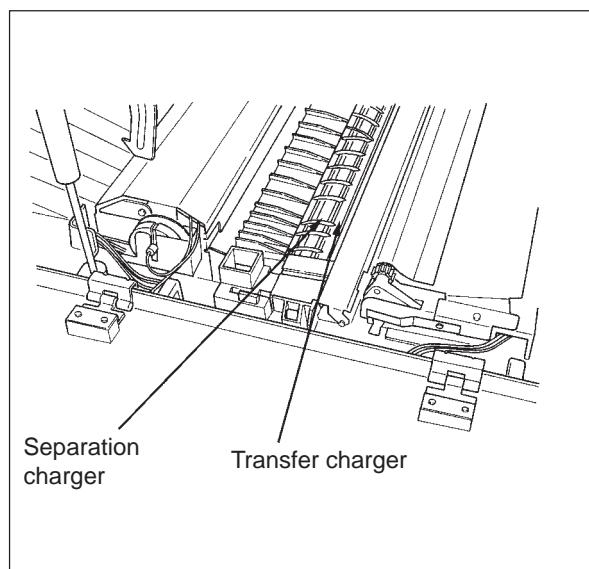
9.2.1 Main charger, discharge lamp and LED erasing array

- Main charger
Places a negative charger on the drum (through a high-voltage transformer).
- Discharge lamp
Eliminates the residual charge on the drum after cleaning.
- LED erasing array
Erases the unnecessary parts of the latent image formed on the drum.



9.2.2 Transfer/separation chargers

- Transfer charger
Helps transfer the toner image on the drum to the copy paper (through a DC high-voltage transformer).
- Separation charger
Strips the copy paper along with the toner image from the drum (through an AC high-voltage transformer).

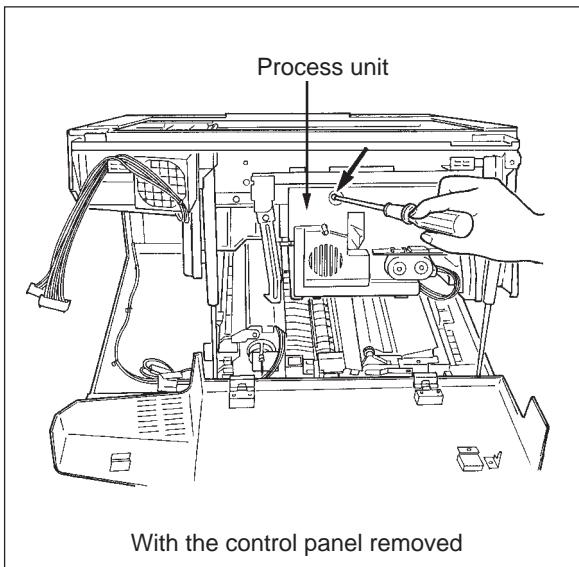


9.3 Disassembly and Replacement

9.3.1 Process unit

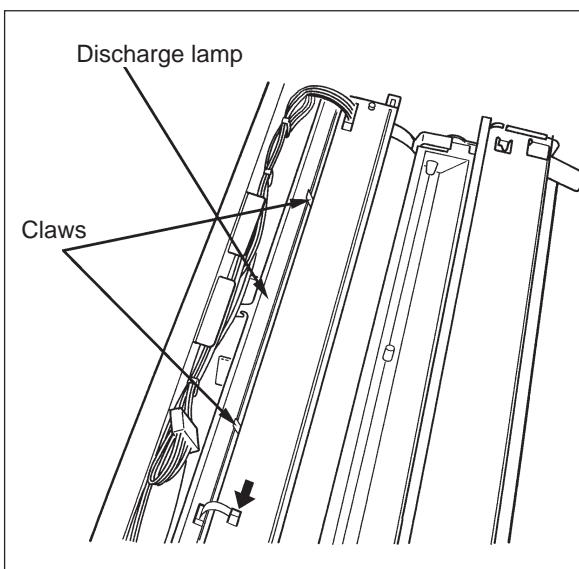
- (1) Remove the toner cartridge.
- (2) After removing one screw, pull out the entire unit to the front and take it out.

Notes: 1. When pulling out the unit, be careful not to touch the drum.
2. In order not to damage the drum, place the unit on the flat surface of a stand.



9.3.2 Discharge lamp

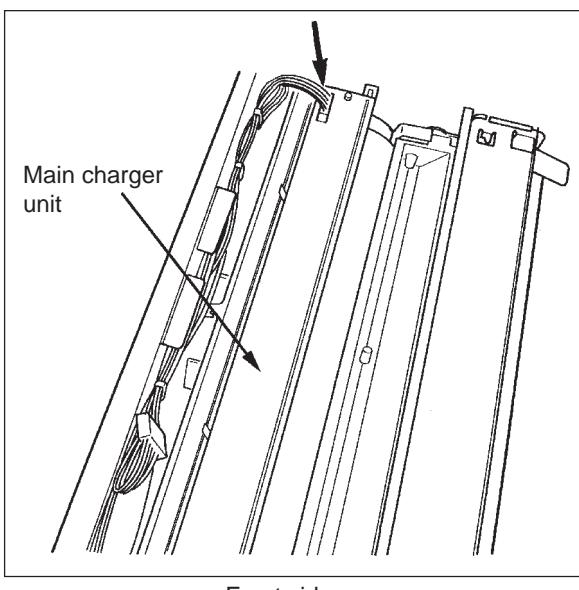
- (1) Remove the process unit.
- (2) Disconnect a connector.
- (3) Disengage two claws and take out the PC board.



9.3.3 Main charger unit

- (1) Remove the process unit.
- (2) Disconnect the one connector.
- (3) Move the entire unit toward the upper to have it disengaged for the rear lock and take it out.

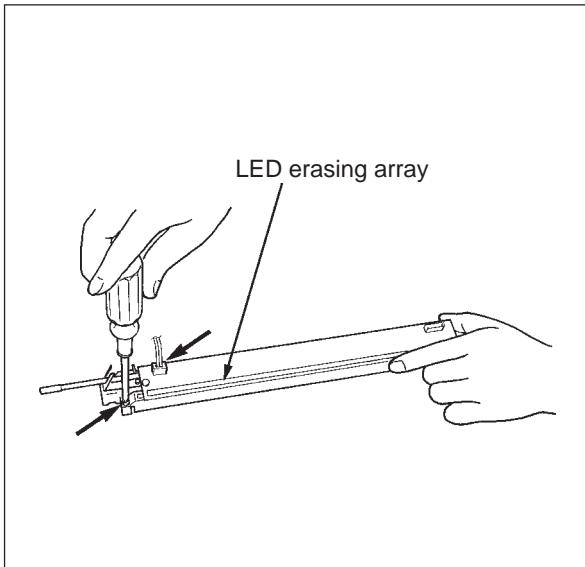
Note: Be careful not to damage the drum.



Front side

9.3.4 LED erasing array

- (1) Remove the main charger unit.
- (2) Remove a connector.
- (3) Remove a screw.



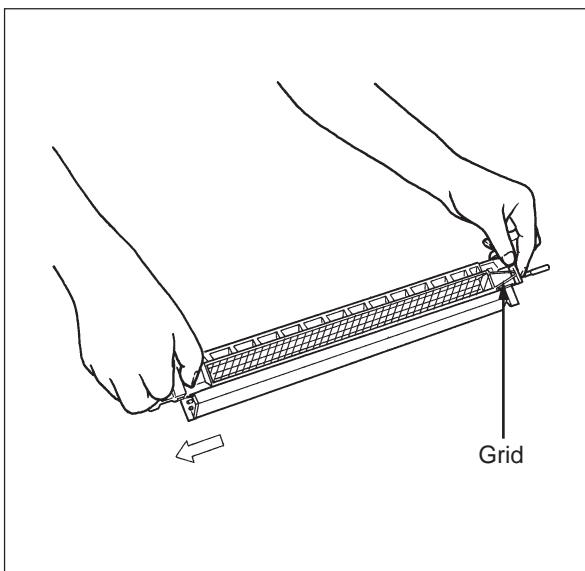
9.3.5 Main charger

- (1) Remove the main charger unit.

Grid

- Remove the grid by pulling it toward the rear.

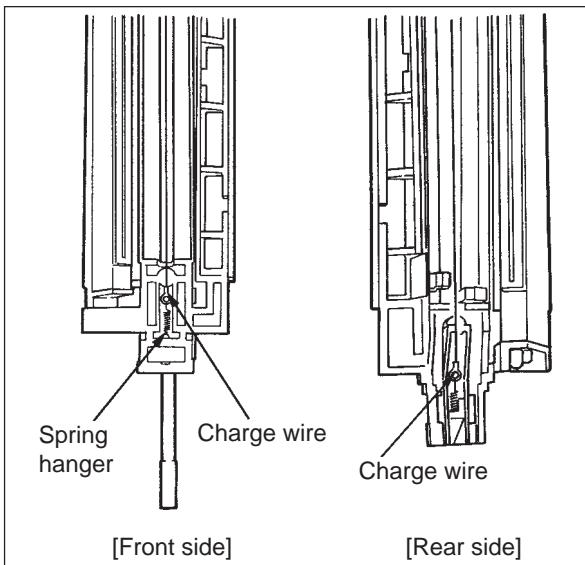
Note: Be careful not to touch the shaded area with a bare hand.



Charge wire

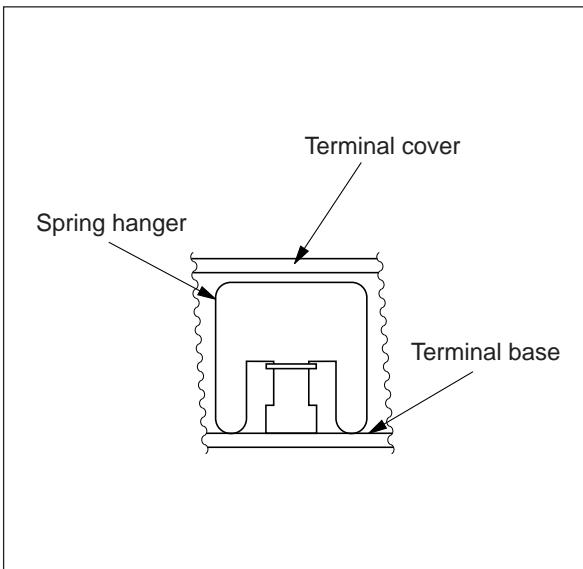
(Entire length: 353 mm; tungsten wire: 0.06 mm dia.)

- Remove the front and rear terminal covers.
- Pinching the hook of the rear terminal cover with cross pliers etc. will facilitate the removal.



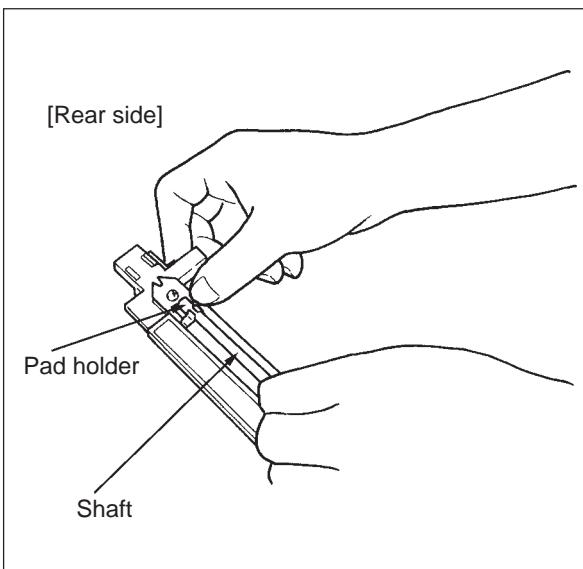
Notes:

1. Pay attention to the direction in which the spring hanger on the front faces.
2. The charge wire should be placed securely in the V-grooves on the front and rear sides.
3. Don't allow the wire to kink.
4. Don't touch the wire with a bare hand.



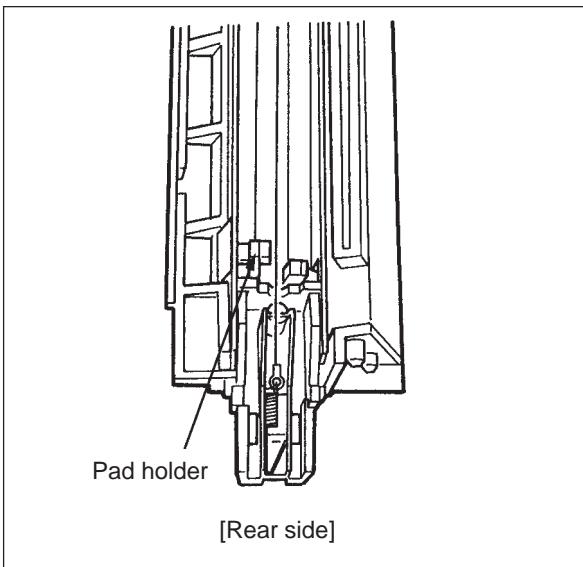
Replacing the cleaning pad:

- (1) Remove the charge wire.
- (2) Remove the LED erasing array.
- (3) Move the cleaning pad to the rear side.
- (4) Remove the pad holder snap from the shaft.



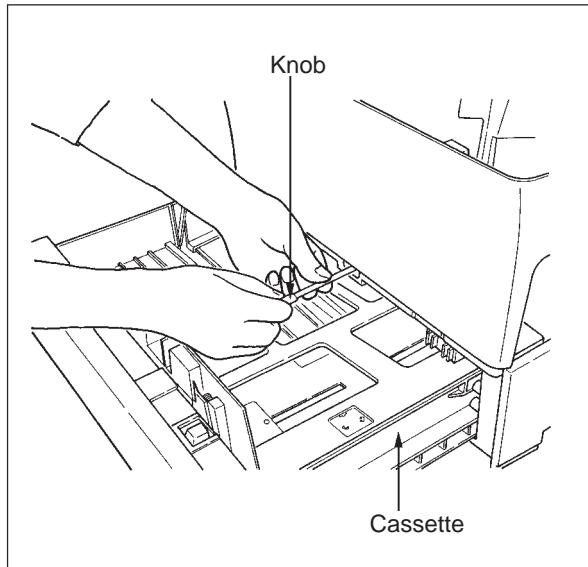
Notes:

1. When reassembling, pay attention to the direction of the pad holder in which it faces.
2. When moved to the rear, the pads (2 pcs.) should be obviously away from the wires.



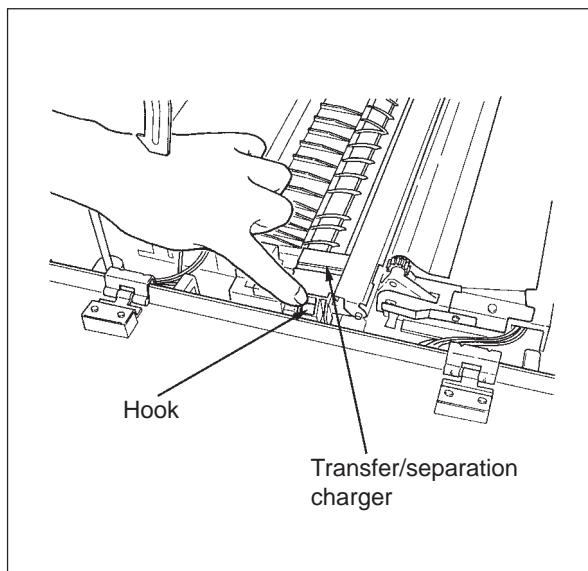
9.3.6 Transfer/separation chargers

- (1) Pull out the cassette.
- (2) Remove the knob for the cleaning-pad shaft.



- (3) After opening the front cover, remove the hook and then take out the entire unit.

Note: When reinstalling the transfer/separation charger, be sure to fit it into the rear terminal guide. Since the charger is pushed up by a spring, make sure that it moves up and down freely.

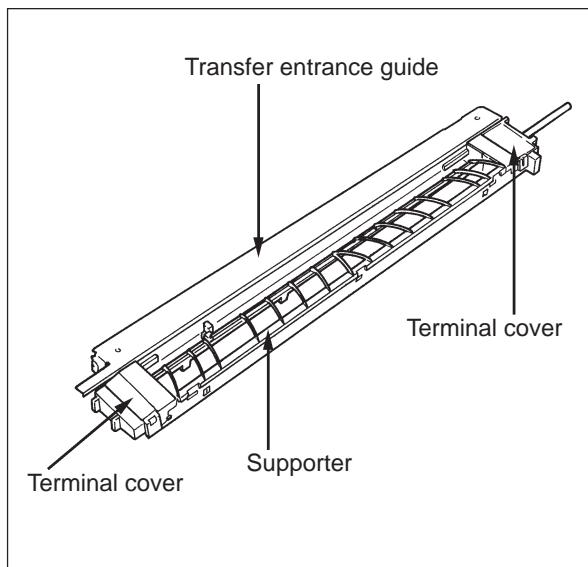


Replacing the charge wire:

(Entire length: 353 mm; tungsten wire: 0.06 mm dia.)

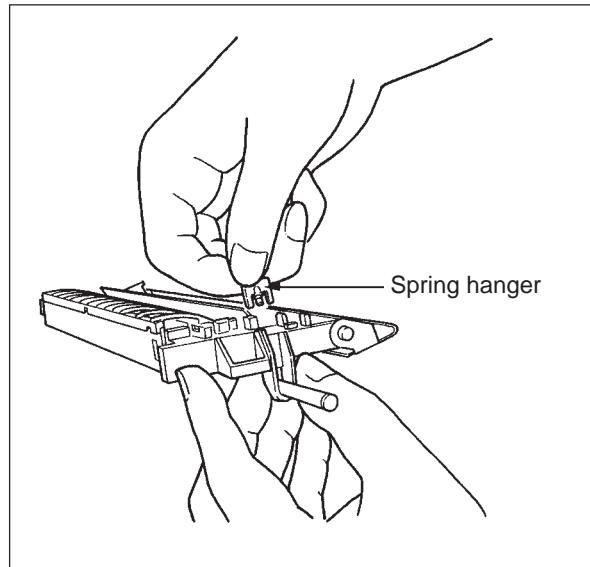
- Disengage the claw of the transfer entrance guide from the rear side.
- Remove the front and rear terminal covers. For the separation charger, remove the supporter in addition.

Note: For replacing the cleaning pad, the same procedure as for the main charger applies.



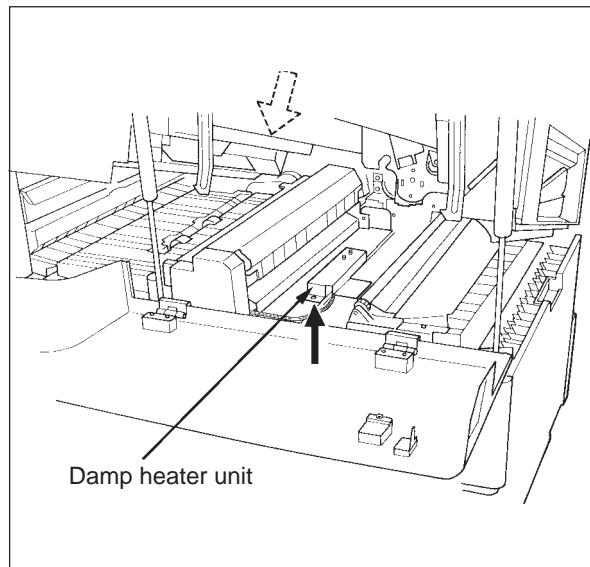
Notes:

1. Pay attention to the direction in which the spring hanger on the front faces.
2. The charge wire should be placed securely in the V-grooves on the front and rear sides.
3. Don't allow the wire to kink.
4. Don't touch the wire with a bare hand.
5. The supporter should be fitted securely in the hook and groove.



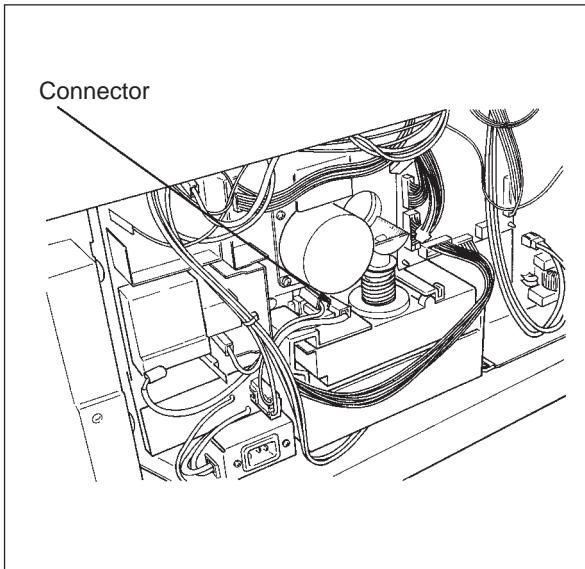
9.3.7 Damp heater unit (Option)

- (1) Remove the transfer/separation charger.
- (2) Remove the transport guide (one screw).
- (3) Remove one screw securing the damp heater.
- (4) Remove the inner cover (lower left) and left-side cover (lower).
- (5) Remove the rear cover.
- (6) Remove a connector.



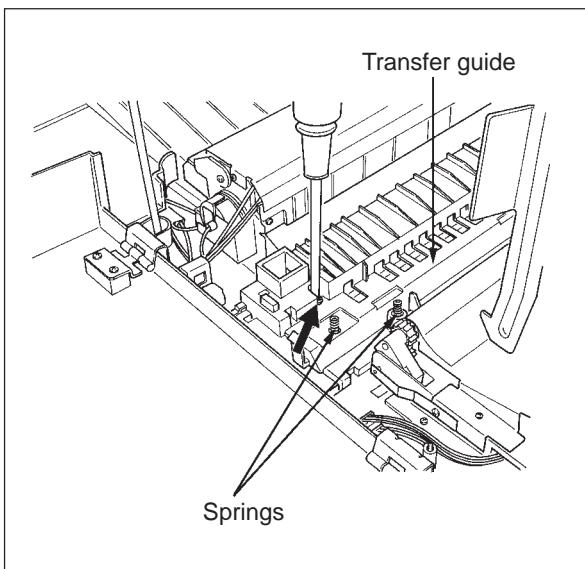
9.3.8 Transfer/separation terminal

- (1) Remove the transfer/separation charger.
- (2) Remove the rear cover and disconnect three connectors.

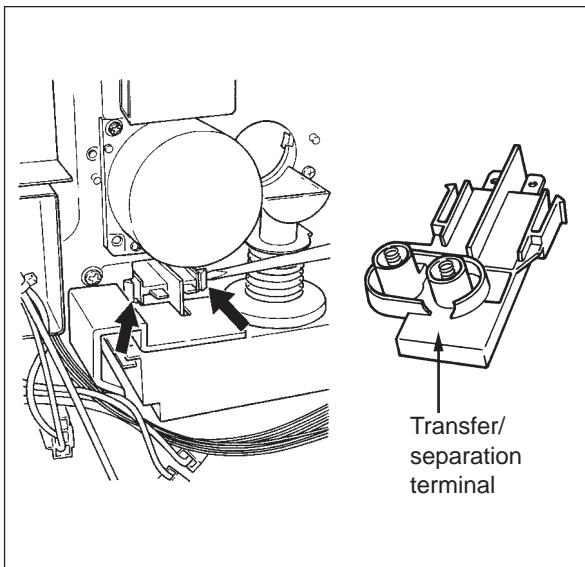


- (3) Remove one screw.
- (4) Pull the transfer guide toward the front slightly and lift it out.

Note: Be careful not lose the charger push-up spring.

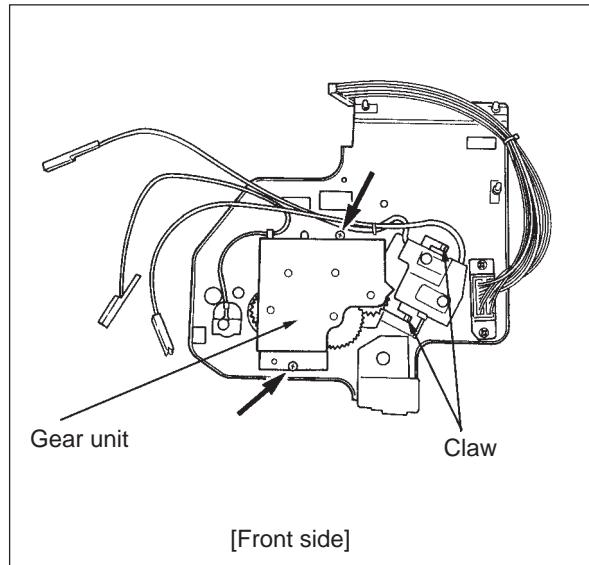


- (5) Remove the two hooks and then take out the transfer/separation terminal from the front side.

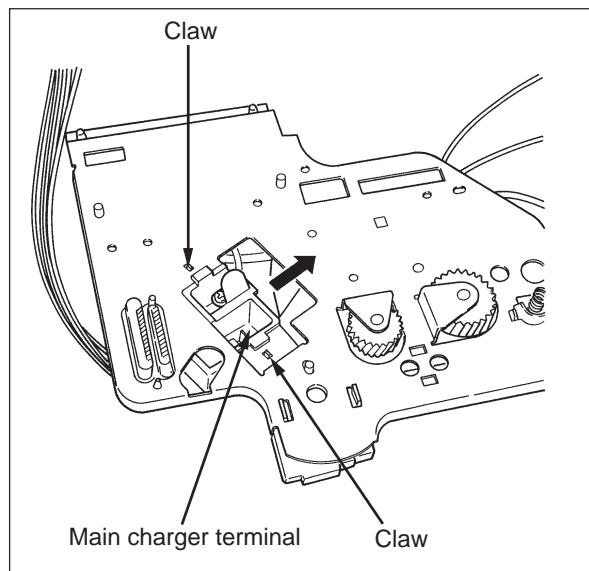


9.3.9 Main charger terminal

- (1) Remove the drive unit.
- (2) Remove the gear unit (2 screws).



- (3) After removing the two claws on the front side, slide out the main charger terminal to the right.

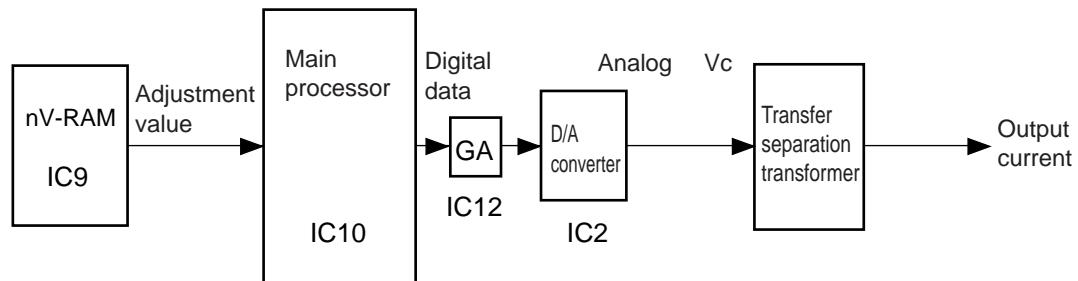


9.4 Transfer/Separation Electric Current Control Circuit

(1) Brief description

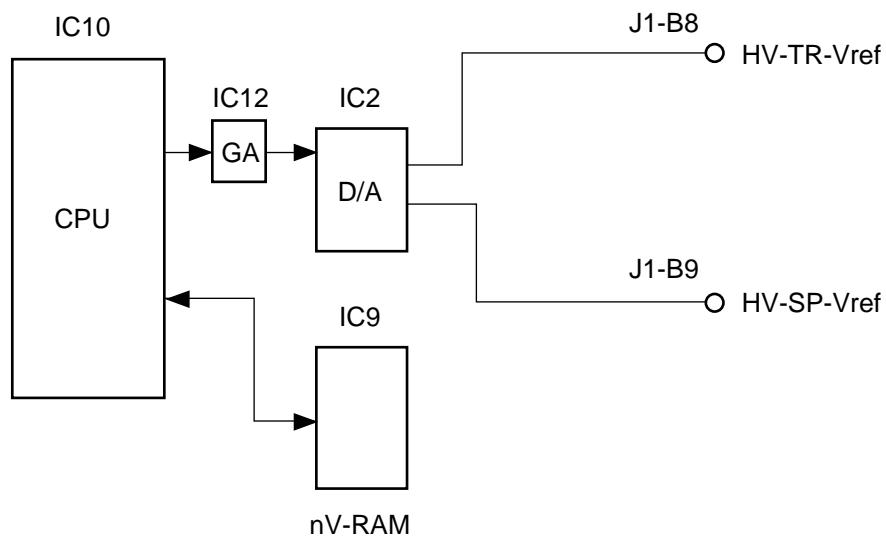
- The circuit generates voltage V_c for transfer and separation output current control.
- Change $V_c \rightarrow$ changes output current to linear.

(2) Description of operation



- Transfer/separation output adjustment value in nV-RAM is fed to main processor.
↓
- The main processor outputs control voltage data through the GA to D/A converter.
↓
- Analog conversion made by D/A converter.
↓
- Control voltage is fed to transfer/separation transformer.
↓
- Transfer/separation transformer generates output current which is proportional to control voltage V_c .

* Adjustment of control voltage V_c (alteration of adjustment data) must be made in AJ mode.



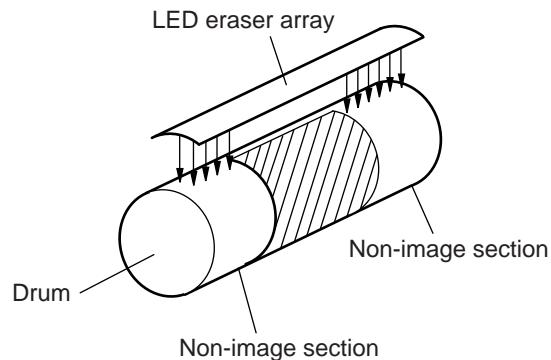
Transfer/separation control circuit diagram

9.5 LED Eraser Array

Brief description

- LED eraser array:
 - a) For reduction copying, the areas on the drum where the light from the exposure lamp does not fall are exposed.
 - b) Exposes the portion, which is out of the paper size and unnecessary charged, according to the cassette size signal.

The LEDs are turned on and the drum surface is irradiated → the charge in the area hit by the light disappears from the drum surface → the image of the section where the light has fallen is therefore erased.



Operation description

- The LED eraser array consists of 32 LEDs, and the LEDs are in the same position in the front/rear direction based on the image center, are connected to the same bit in parallel.
- Data (according to input coordinate for paper size, reproduction rate) from the logic PC board are fed to LED eraser array by 64 bits (effective data are the last 16 bits).
Data "1": LED ON, Data "0": OFF (the level on the input pins of IC L7932 of the driver controller)
Ex.) When one LED is turned ON at both ends of LED array:
- "1" is fed from logic PC board to the 64th (last) datum (16th effective datum), and "0" to data 1 – 63 (effective data 1 – 15).

↓

- "1" is set in shift register equivalent to ED1 and ED32, and "0" is set for the others.

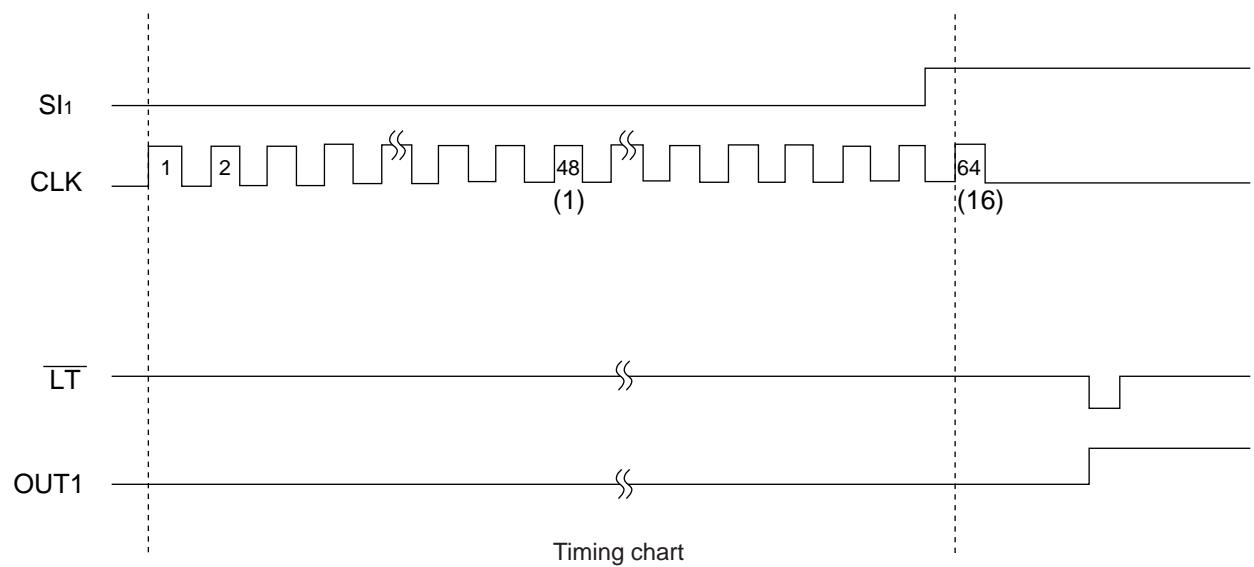
↓

- After setting is completed, it is transferred to latch.

↓

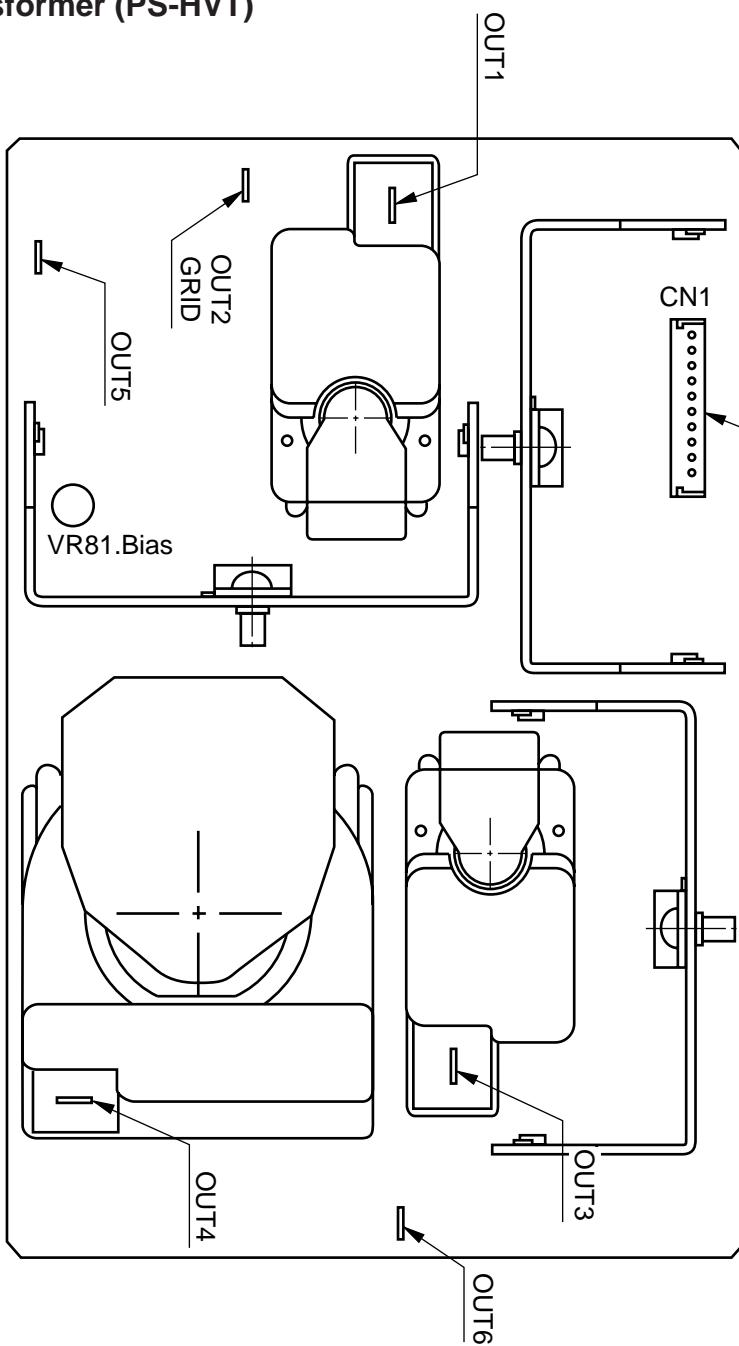
- According to the driver, turn ON LED on both ends in accordance with data.

A timing chart for the above is shown below.



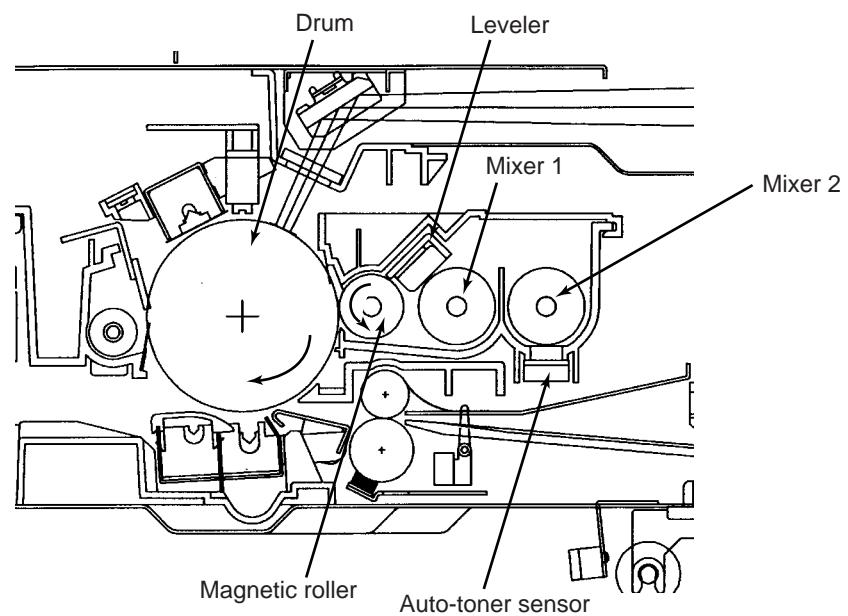
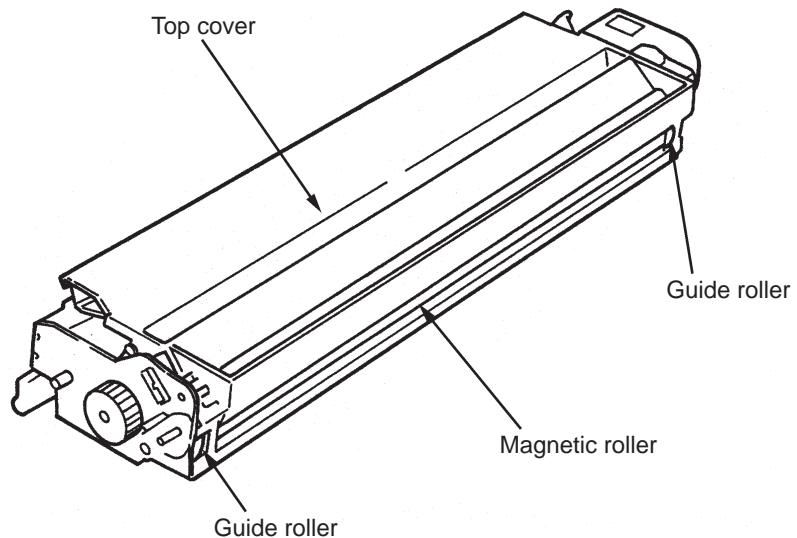
9.6 High-Voltage Transformer (PS-HVT)

Input connector		Output 1		Output 2		Output 3		Output 4		Output 5		Output 6	
Pin No.	Signal	Output 1	Charge	Output 2	Grid	Output 3	Transfer	Output 4	Separation	Output 5	Developer bias	Output 6	Guide bias
1	M-VREF												
2	HVT-M-ON												
3	G-VREF												
4	+24V												
5	DG												
6	HVT-TR-ON												
7	TR-VREF												
8	HVT-GB-ON												
9	HVT-SP-ON												
10	SP-VREF												



10. DEVELOPER UNIT

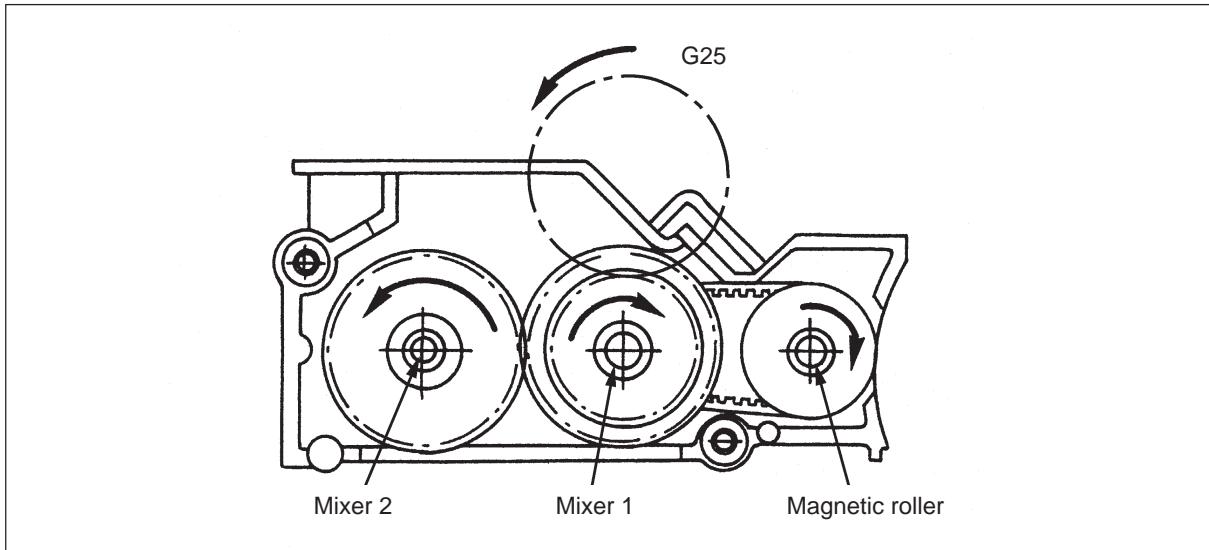
10.1 Construction



Front sectional view

10.2 Drive System

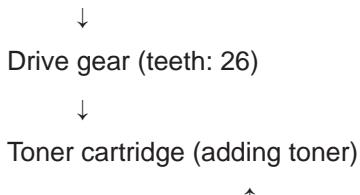
10.2.1 Magnetic roller, mixer 1 and mixer 2



[Rear side]

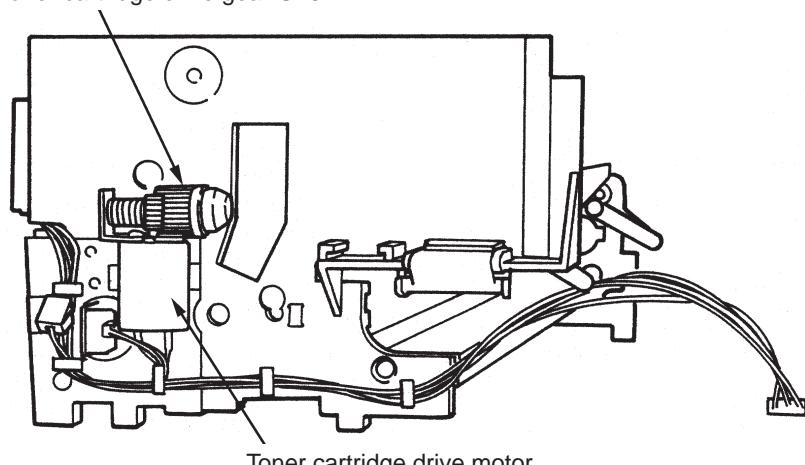
10.2.2 Toner cartridge

[Developer-unit front side] Toner cartridge drive motor



↑
Toner is mixed by mixers 1 and 2.

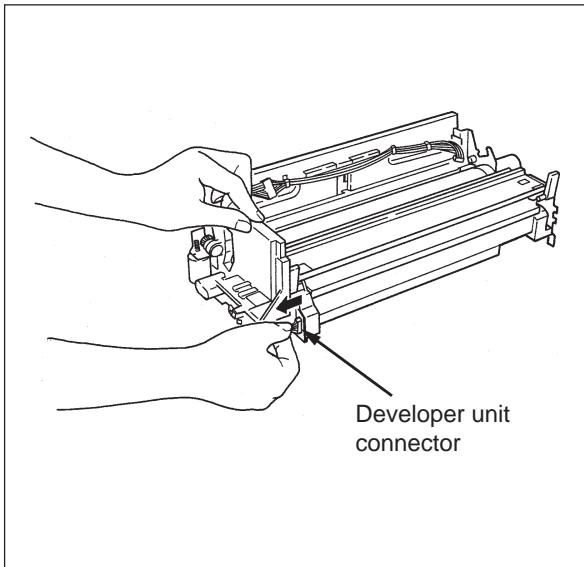
Toner cartridge drive gear G26



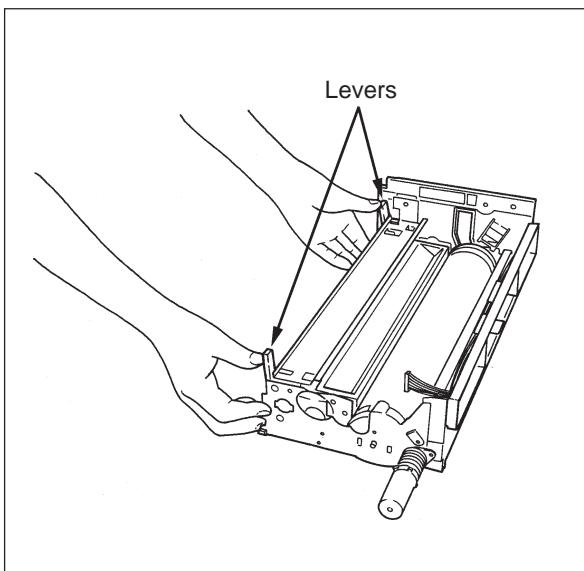
10.3 Disassembly and Replacement

10.3.1 Removal and installation of the developer unit

- (1) Remove the process unit.
- (2) Disconnect the developer unit connector.



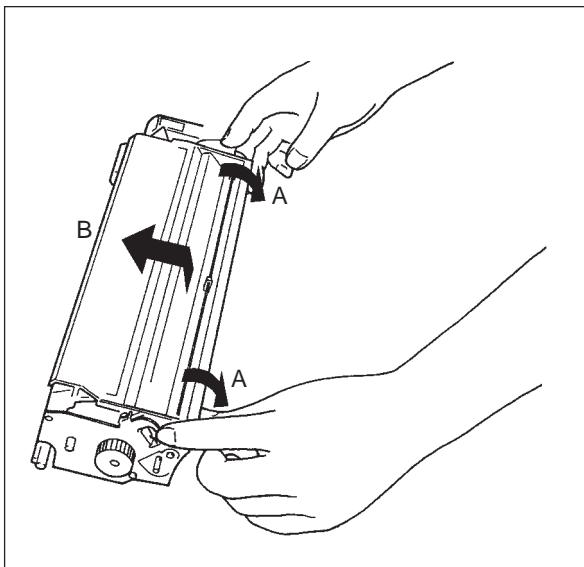
- (3) Lifting the levers, take out the developer unit.



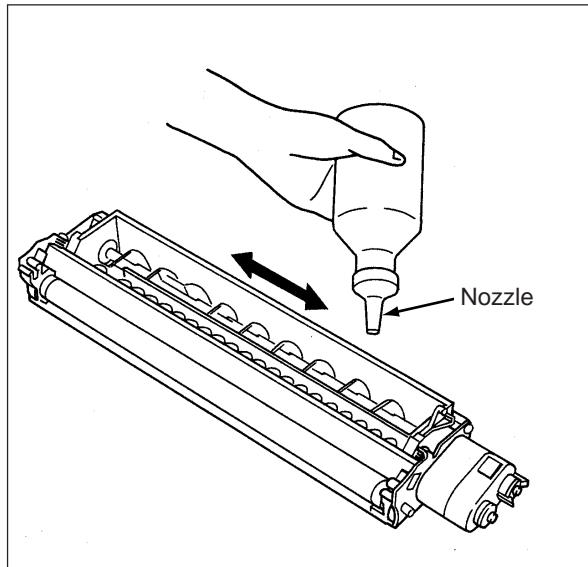
10.3.2 Installing the developer material

- (1) Remove the top cover (by rotating the two plate spring hooks in the direction of "A" and moving the cover in the direction "B").

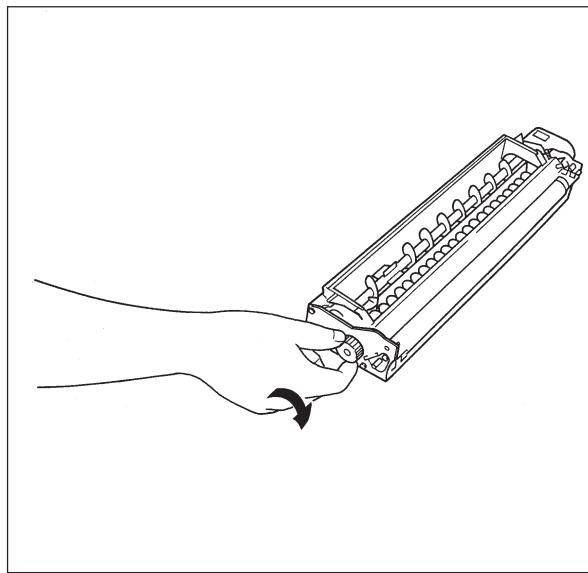
Note: While doing the above, be careful not to damage the seal affixed to the back side of the top cover.



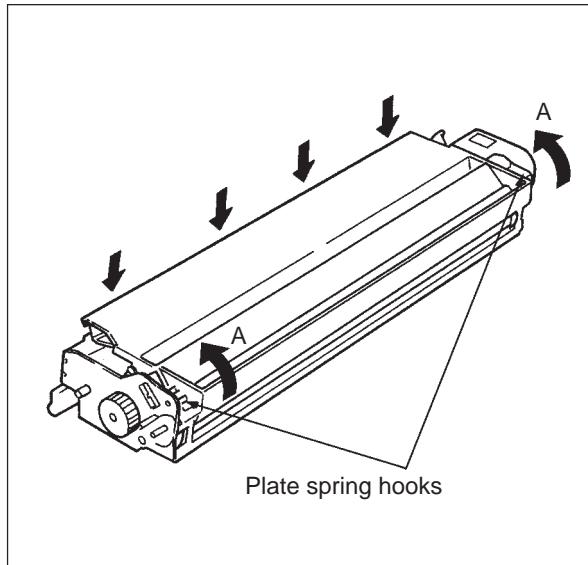
(2) Remove the cap from the developer bottle and install the nozzle (service jig) to the bottle. Pour the developer material into the developer unit.



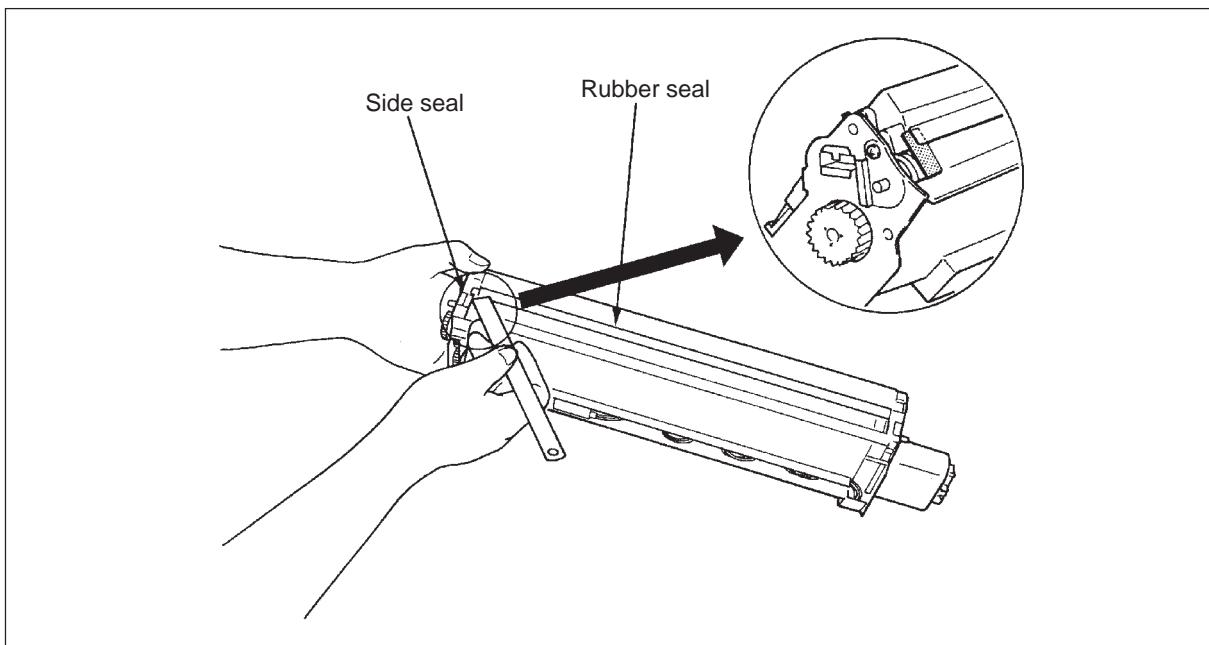
(3) After pouring in the developer material, rotate the gear in the direction of the arrow as shown to deliver the developer material onto the magnetic roller.



(4) Reinstall the top cover; after inserting the hooks (4 places) firmly, fix the plate spring hooks by rotating in the direction of arrow A securely.

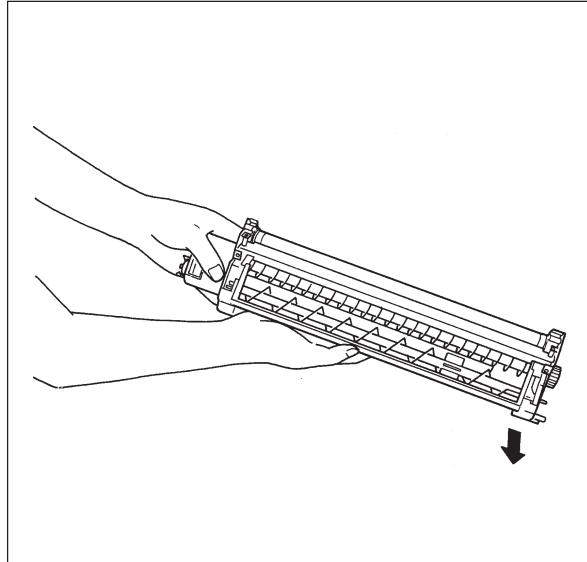


(5) Pay special attention to the overlapping of the side shields (front and rear) and the rubber seal when installing the top cover; the rubber seal should be over the side seals.



10.3.3 Removing the developer material

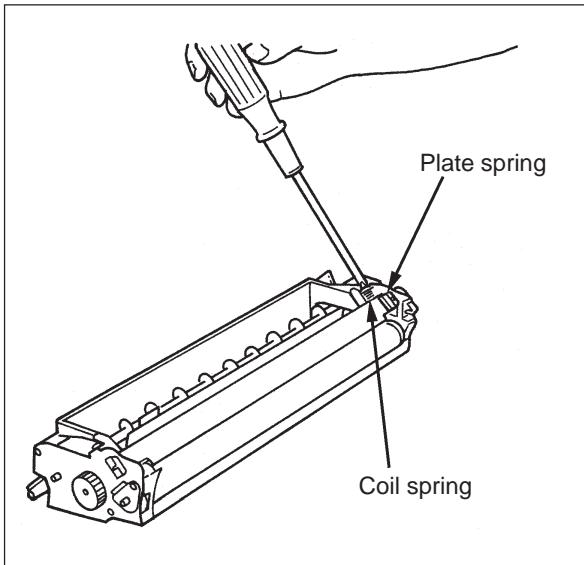
While tilting the developer unit, let the developer material drain out from the position shown with an arrow. Be careful not to allow gears and connectors nearby to get stained with developer material.



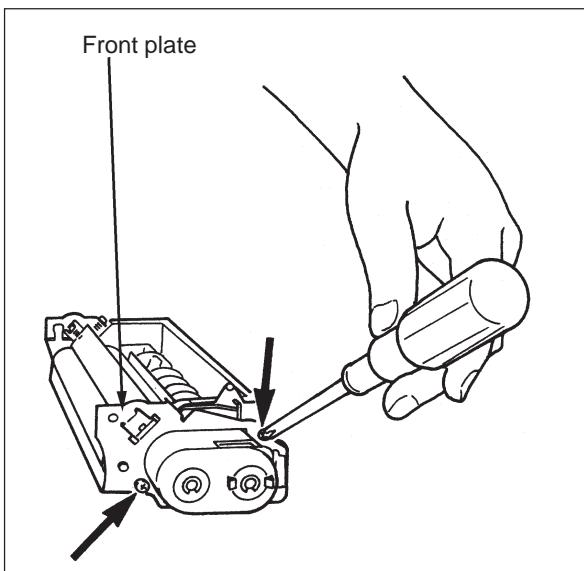
10.3.4 Guide rollers

Front side

- (1) Pour out the developer material from the developer unit.
- (2) Remove the leveler adjustment screw and the springs (a coil spring and plate spring) at the front.

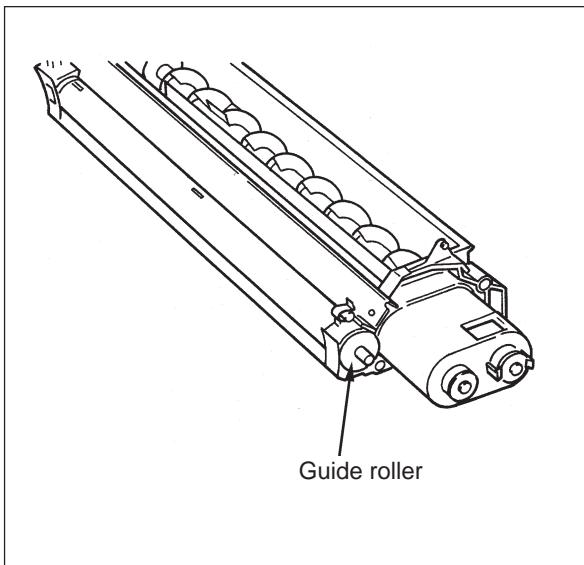


- (3) Remove the front plate (2 screws).



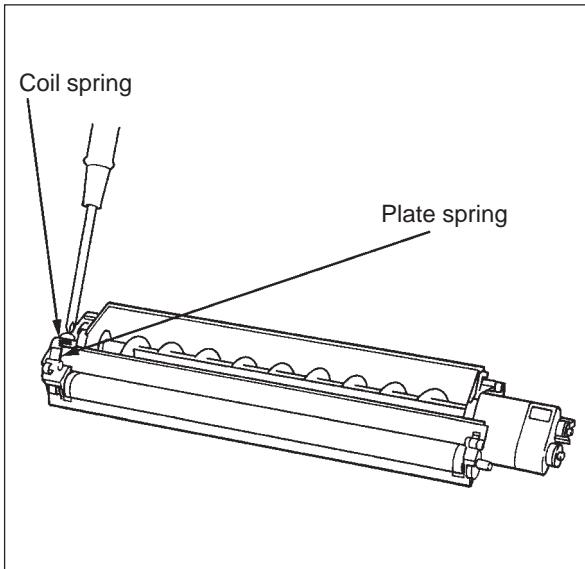
- (4) Replace the guide roller.

Note: When reinstalling the front plate, be careful not to allow the harness to be pinched.



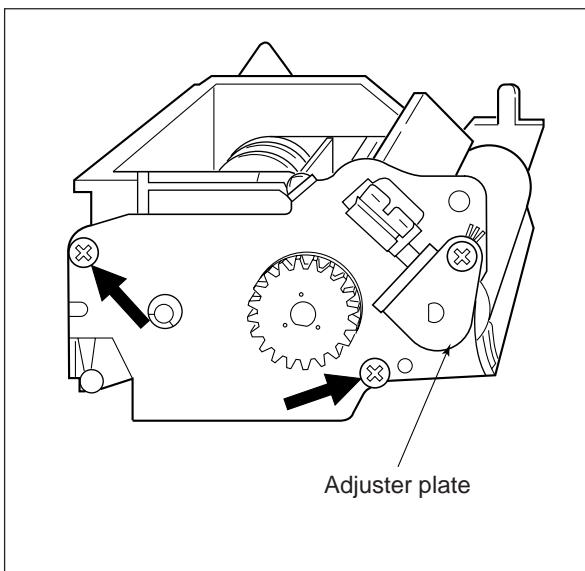
Rear side

- (1) Pour out the developer material (refer to para. 10.3.3).
- (2) Remove the leveler adjustment screw and the springs (a coil spring and plate spring) at the rear.



- (3) Remove the adjuster plate (1 screw).
(Before removing it, memorize its original position.)

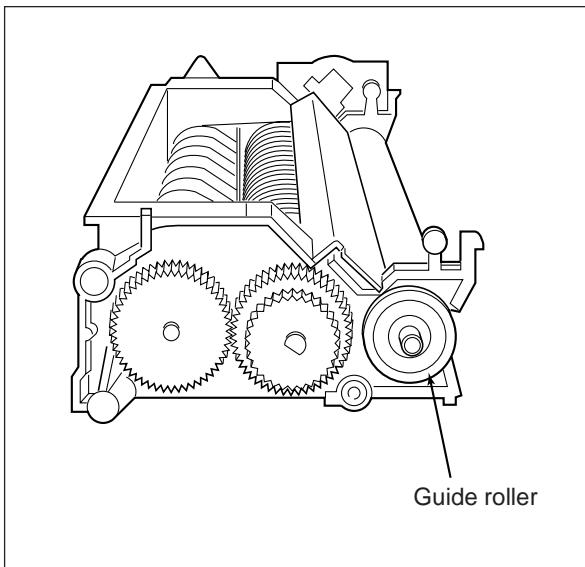
Remove the rear plate (2 screws).



- (4) Replace the guide roller.

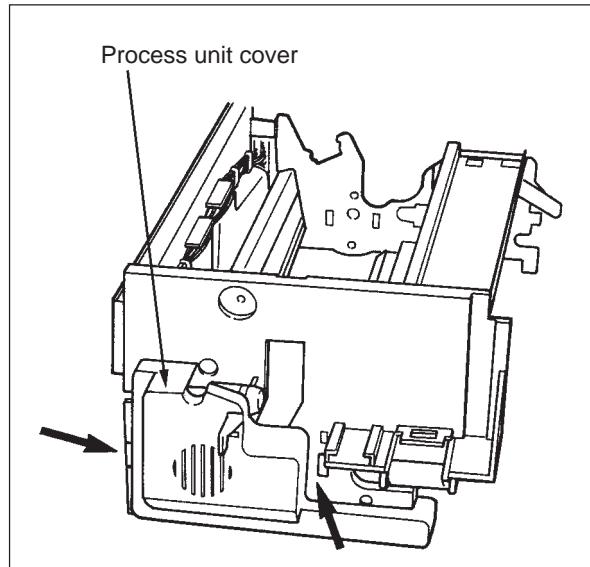
Notes:

1. The guide roller is common for the front and rear sides.
2. After reassembly, the doctor-to-sleeve gap and the pole position should be adjusted.

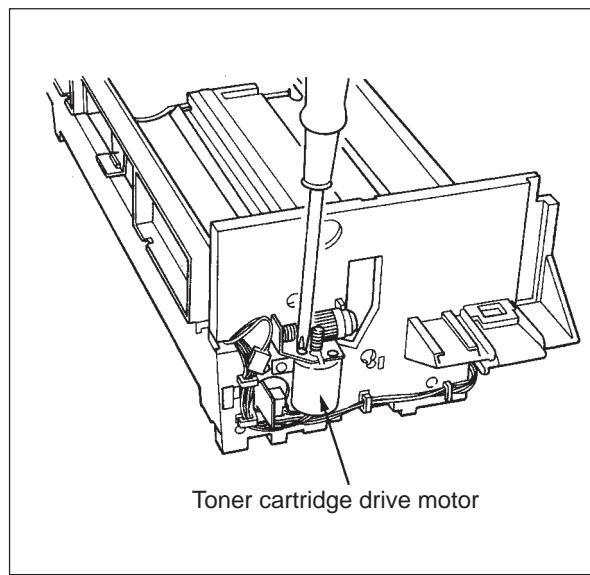


10.3.5 Toner cartridge drive motor

- (1) Remove the process unit.
- (2) Remove the process unit cover (2 claws).

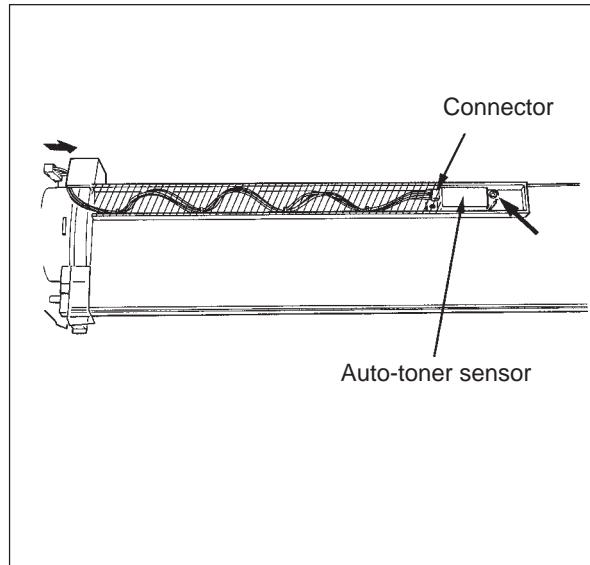


- (3) Take out the toner-cartridge drive motor (1 screw and connector).



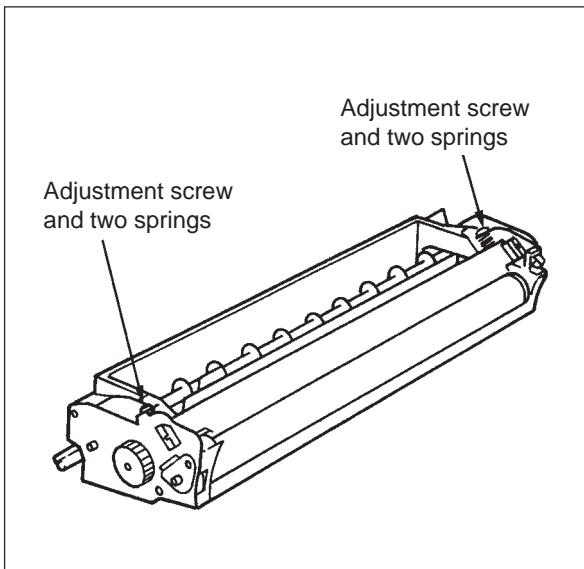
10.3.6 Auto-toner sensor

- (1) Pour out the developer material from the developer unit.
- (2) Place the developer unit upside down and remove the auto-toner sensor (1 screw and connector).

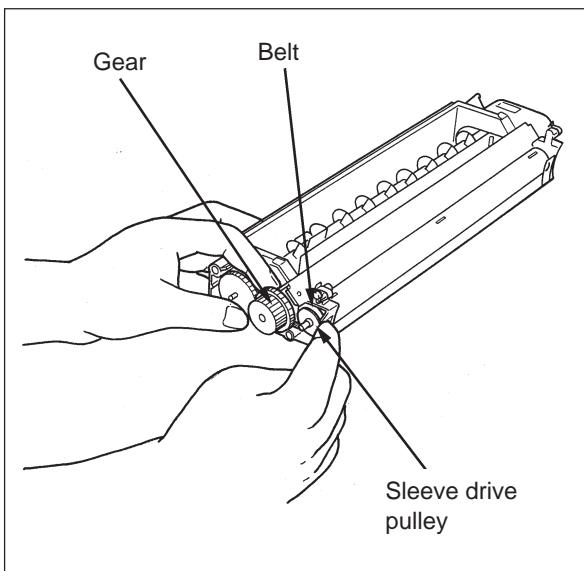


10.3.7 Magnetic roller

- (1) Pour out the developer unit from the developer unit. (Refer to para. 10.3.3.)
- (2) Remove the front plate and the guide roller. (Refer to 10.3.4 Para. Front side.)
- (3) Remove the adjustment plate, rear plate and guide roller. (Refer to 10.3.4 Para. Rear side.)
- (4) Remove the leveler (2 adjustment screws, 2 coil springs and 2 plate springs).

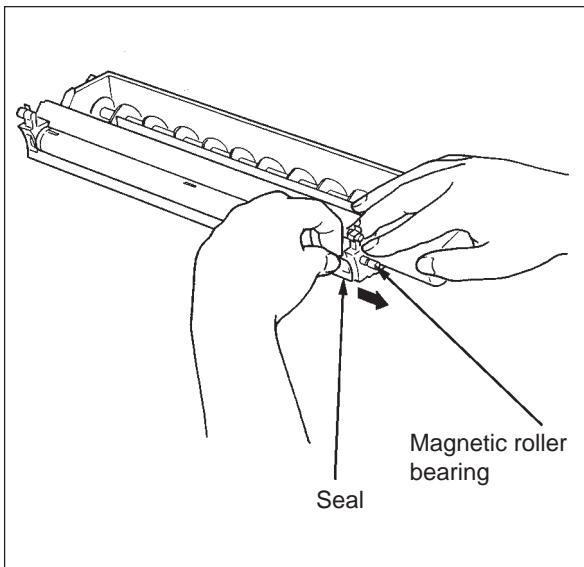


- (5) Remove the sleeve drive pulley, gear and belt.



- (6) Peel off the seal on the front and take out the magnetic roller bearing. After removing the magnetic roller from the frame slit, move the magnetic roller in the direction of the arrow and take it out toward you.

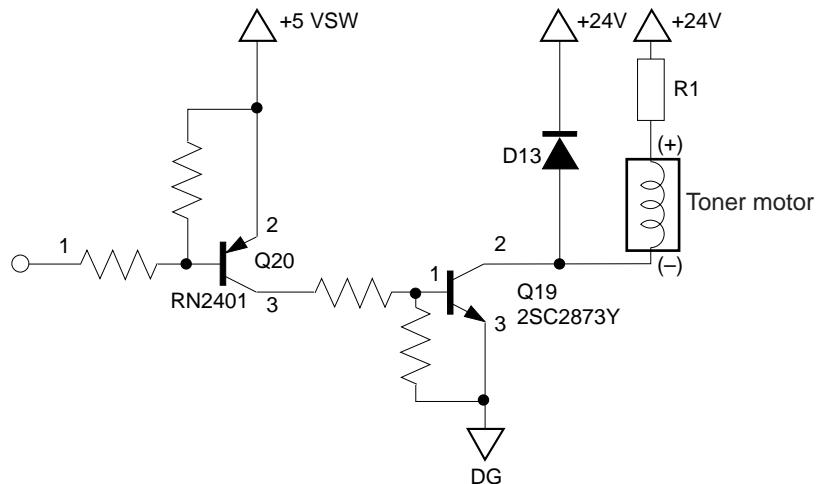
Note: After reassembly, the doctor-to-sleeve gap and the pole position should be adjusted.



10.4 Brush Motor Drive (M9)

The toner motor is provided to supply toner to the developer unit.

The toner motor is driven by 2SC2873Y (Logic PC board: Q19).



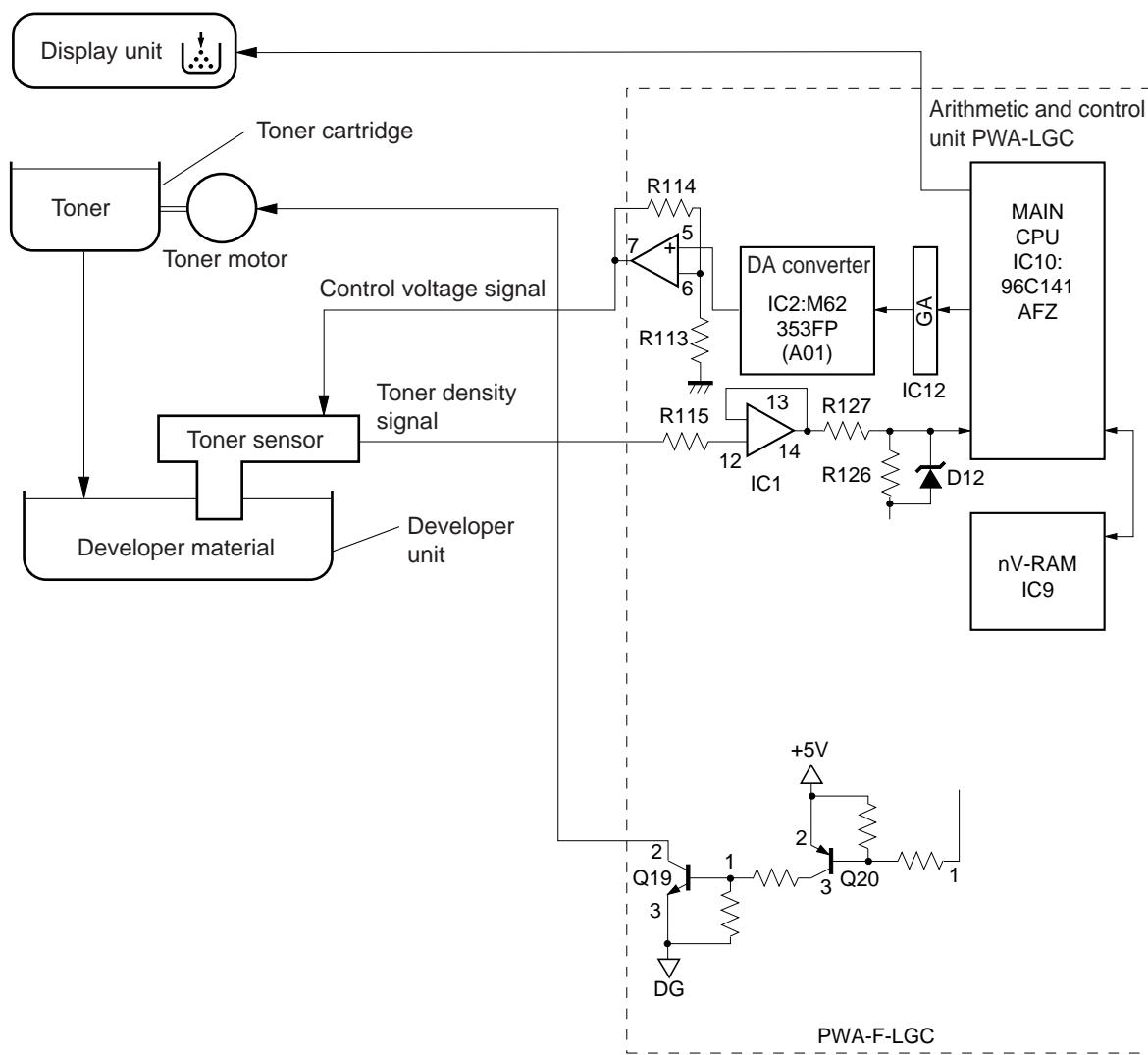
The (+) and (-) terminals of the motor winding is connected to +24V and pin 2 of Q19, respectively.

- When pin 1 of Q20 becomes "L", pin 2 of Q19 also becomes "L".
- A collector current flows from the +24V supply through the motor winding causing the motor to rotate.
- When pin 1 of Q20 becomes "H", pin 2 of Q19 also becomes "H", causing the current flowing through the motor winding to flow to the +24V supply through D13.→The current decreases with a time constant determined by the inductance and resistance of the winding→causing the motor to stop.

10.5 Auto-Toner Sensor Circuit

Brief description

- Functions of auto-toner circuit:
 - Detects density of toner in developer material.
~ Density drops toner supply
 - Detects that toner in toner cartridge has been used up (toner empty).
- Configuration of auto-toner circuit
 - Auto-sensor: Detects toner density.
 - Control section: Control to maintain toner in developer at a constant specific density.
 - Toner motor: Replenishes the toner in the developer unit.
 - Display unit: Displays toner-empty status.



Operation of auto-toner sensor

(1) Functions of auto-toner sensor

Ⓐ Initialization adjustment function:

- When new settings are entered or when developer is replaced. –

Automatic or semi-automatic adjustment is made so that the output of the auto-toner sensor will be 2.3 – 2.5 V (input of IC8) against the toner density of the new developer material.

Ⓑ Toner density stabilization function:

- During copying operation –

- Toner consumption → toner density decreases → auto-toner sensor output changes are detected → toner motor is driven → toner is supplied to developer unit from toner cartridge.
 - ~ The toner density is maintained at a constant level.

Ⓒ Toner-empty detection and release function:

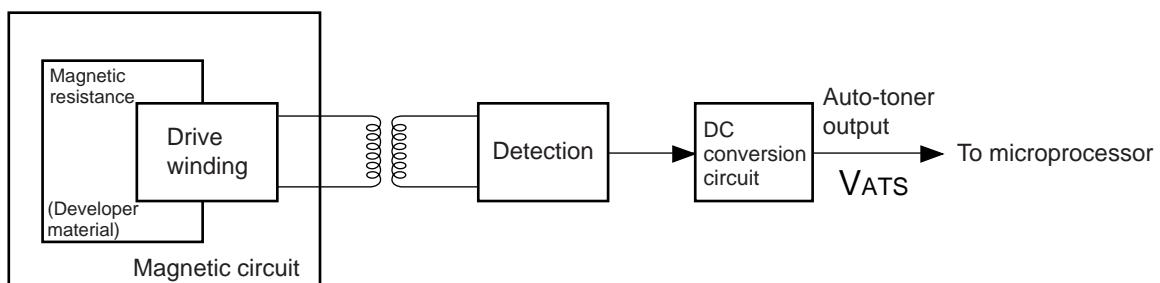
- Detects toner-empty state inside toner cartridge
 - ~ Drives toner motor → auto-toner sensor output is not changed → toner density does not change → judges that there is no toner (toner empty)
- Release of toner-empty state
 - ~ Toner cartridge replacement → drives toner motor → auto-toner sensor output changes → toner density returns to normal value → toner-empty state is released.

(2) Operation of auto-toner sensor

The auto-toner sensor is composed of the following circuits:

- Drive winding: Magnetic head which receives a high-frequency magnetic field (primary side). When placed in developer material, it forms magnetic circuit.
- Detection winding: Receives the changes in magnetic resistance of the developer material via a magnetic circuit (secondary side).
- DC conversion circuit: Converts the high-frequency output emitted from the detection winding to a DC signal.

↓
Auto-toner output VATS



– When the toner density is low –

 The toner amount in the developer material is less than the required level in comparison with the iron powder (carrier).

 → Magnetic reluctance: Small → detection output: Large → Auto-toner output VATS: Large

– When the toner density is high –

 The toner amount in the developer material is more than the required level in comparison with the iron powder (carrier).

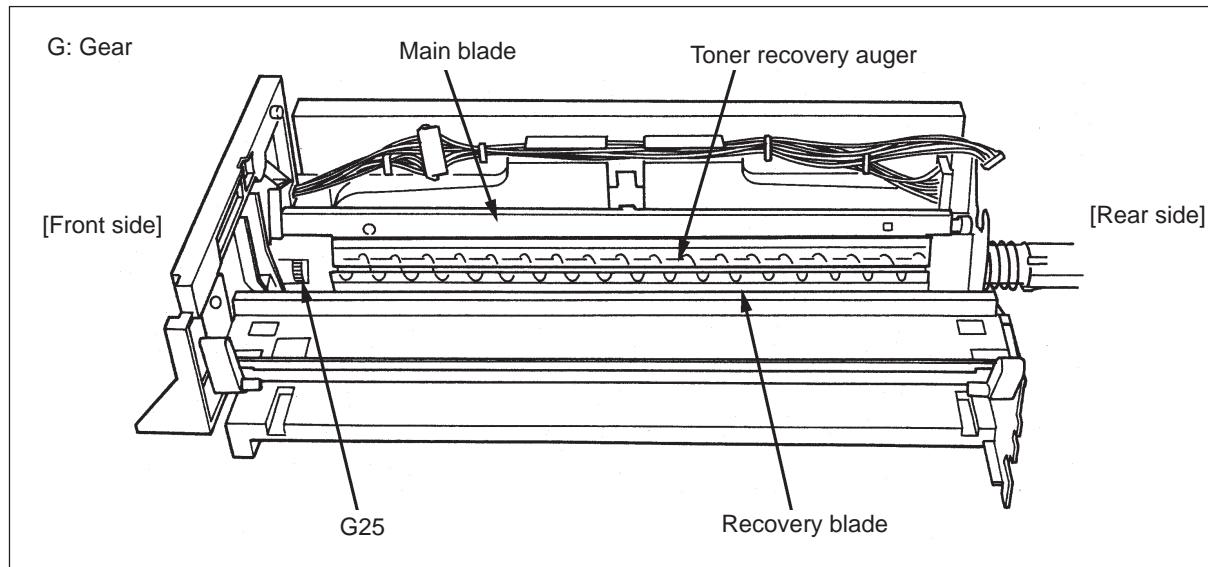
 → Magnetic reluctance: Large → detection output: Small → auto-toner output V: Small

- DC voltage corresponding to toner density in the developer material = auto-toner output VATS.

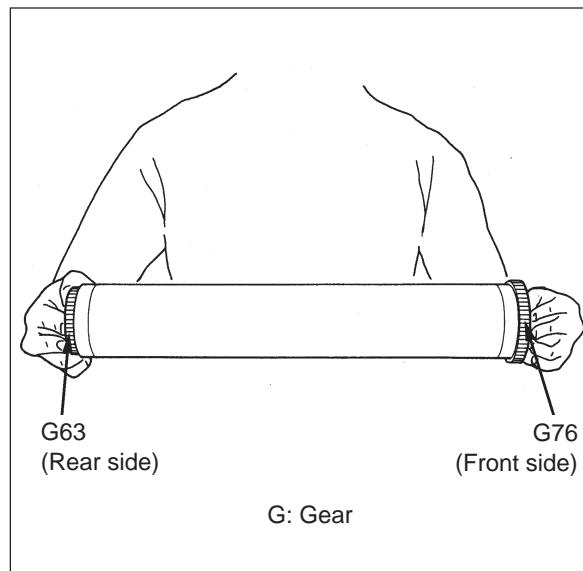
11. CLEANER UNIT (Shares Part of the Process Unit)

11.1 Construction

The cleaner unit consists of the main blade, recovery blade, toner recovery auger, toner bag, etc. (For the main charger, LED erasing array, discharge lamp, etc., refer to Chapter 9.)



View with the drum, main charger unit and developer unit removed



View with the drum removed

11.2 Explanation of Functions

- Main blade

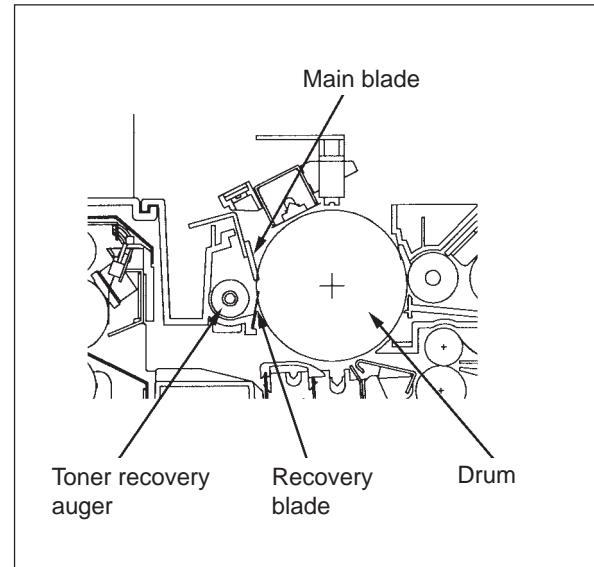
Scrapes the drum surface to remove the residual toner. The main blade is pressed on the drum with a fixed pressure by the pressure spring.

- Recovery blade

Collects the toner scraped off by the main blade.

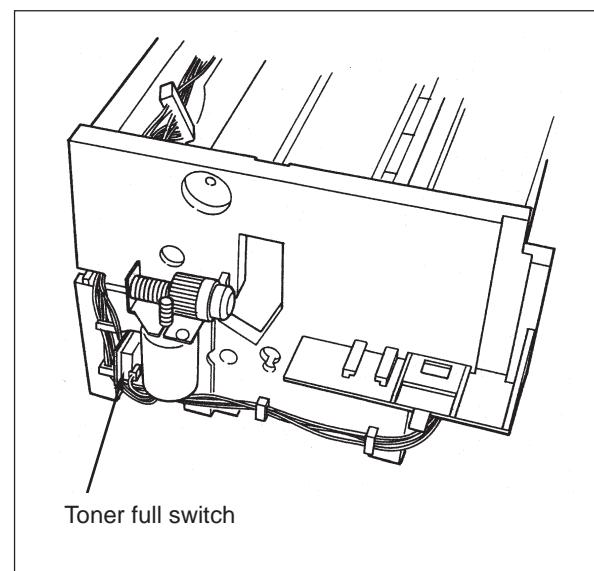
- Toner recovery auger

Transports the toner scraped off to the toner bag on the rear side.



- Toner full switch

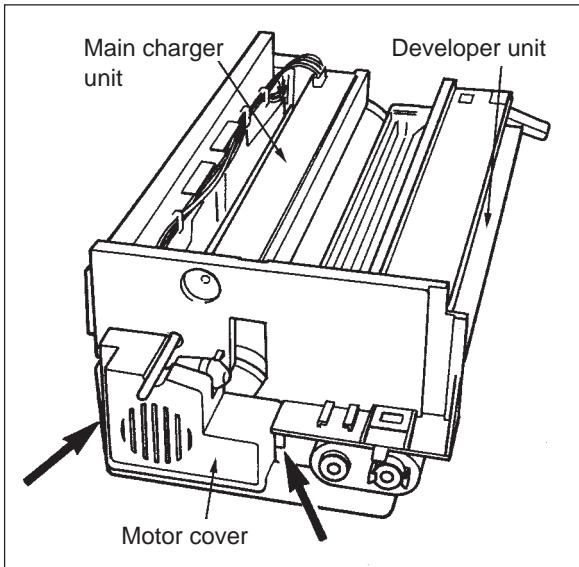
When the toner bag becomes full of recovered toner, the toner recovery auger is forced to the front, causing the toner full switch (S10) to be turned on.



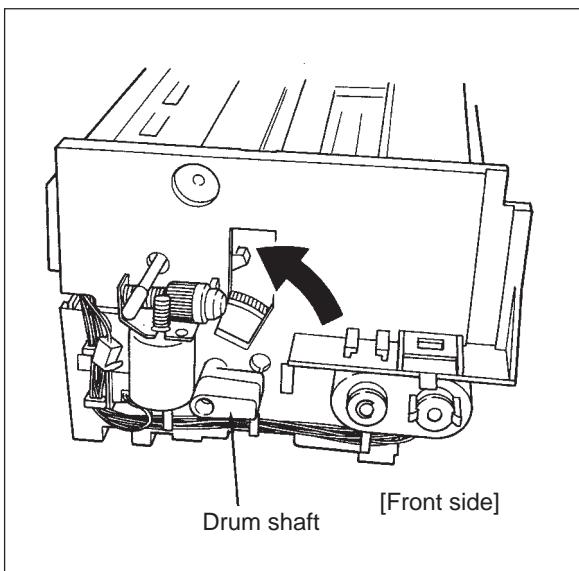
11.3 Disassembly and Replacement

11.3.1 Cleaner unit

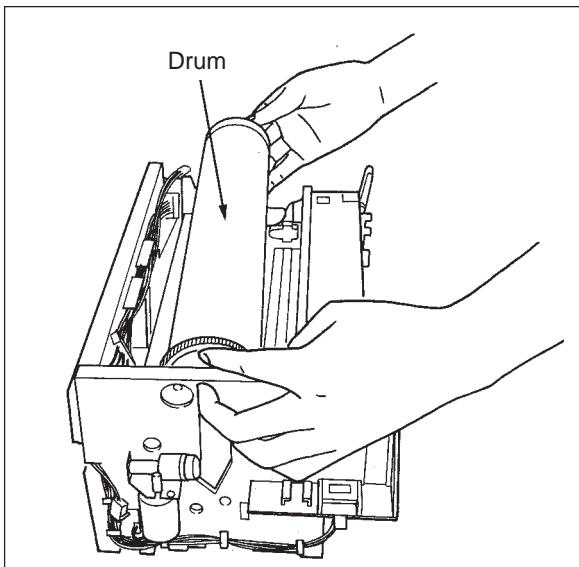
- (1) Remove the process unit. Refer to para. 9.3.1.
- (2) Remove the drum (when it is to be replaced).
 - Remove the developer unit.
 - Remove the main charger unit.
 - Disengage the two claws to remove the motor cover.



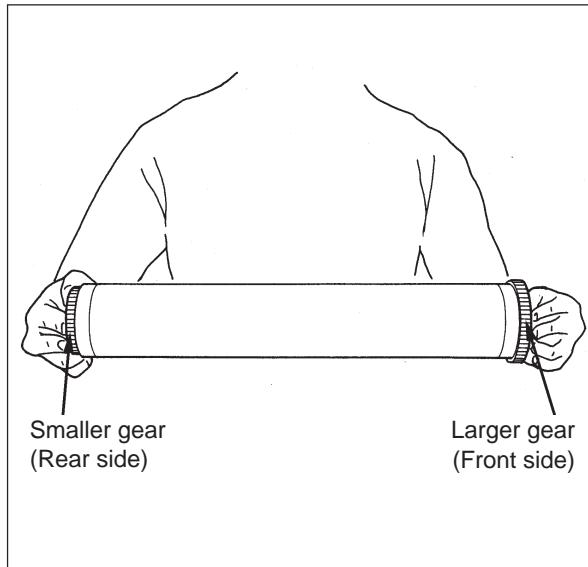
- Unlock the drum shaft lock (by rotating it in the direction of the arrow) and then pull the shaft out from the front.



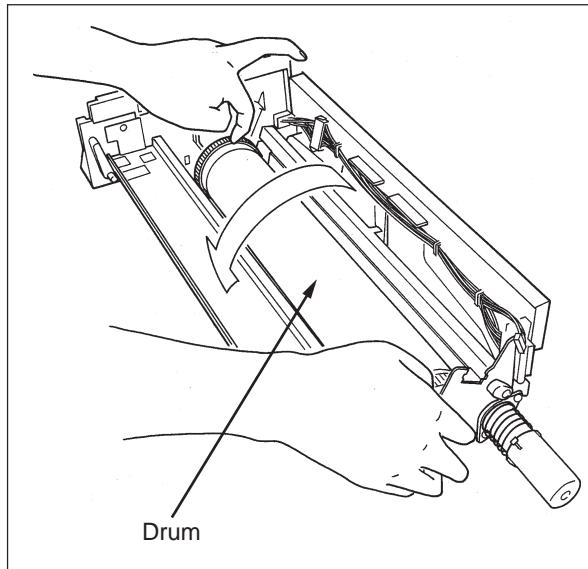
- When removing the drum, place your hands on the sides of the drum, as shown in the figure on the right and take it out carefully.



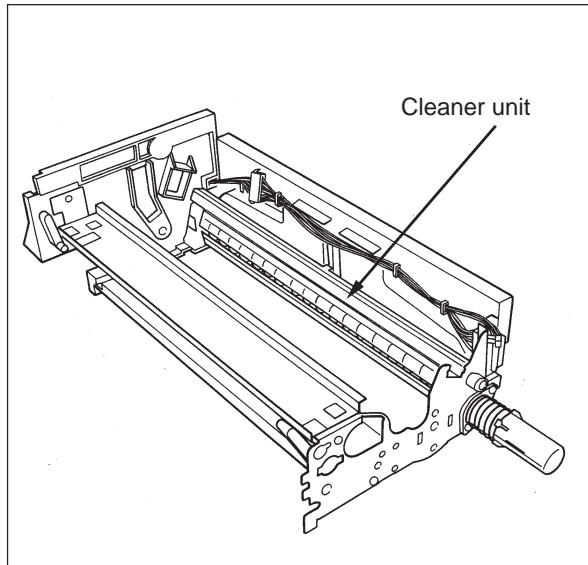
Notes: 1. When setting the drum in the process unit, its smaller drive gear should be on the rear side.



2. After inserting the drum shaft, apply patting powder on the entire surface of the drum and rotate the drum toward you.

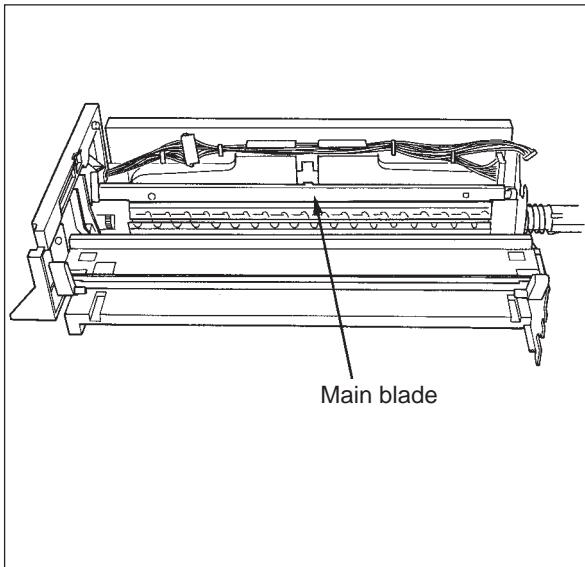


The figure on the right shows the cleaner unit after the developer unit, main charger unit and drum are removed from the process unit.

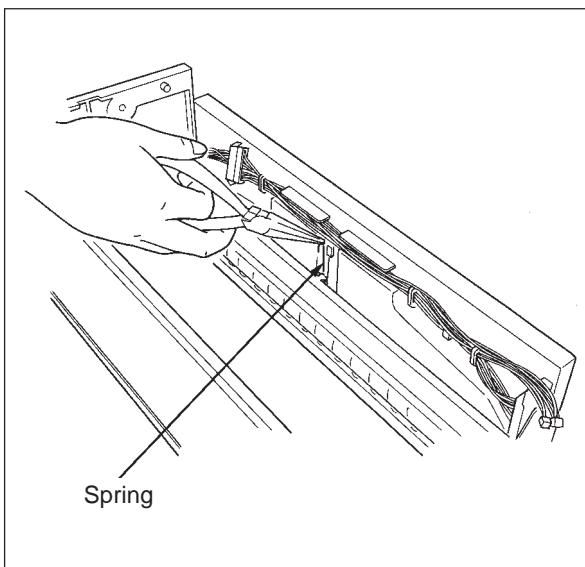


11.3.2 Main blade

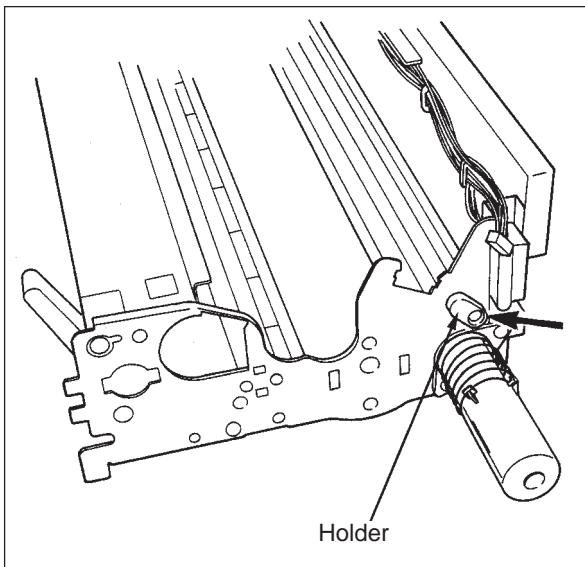
- (1) Remove the developer unit, main charger unit and drum.



- (2) Remove the spring.

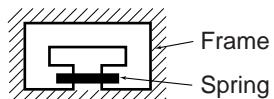


- (3) Remove the holder on the rear (1 screw).
- (4) Remove the blade.

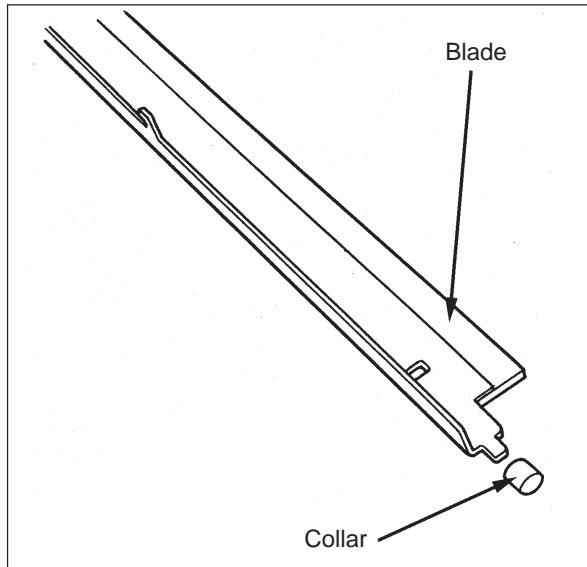


(5) Remove the collar on each side of the blade and install them to the new blade.

Notes: 1. During reassembly, attach the spring securely. (Make sure that the frame side should look as shown below.)

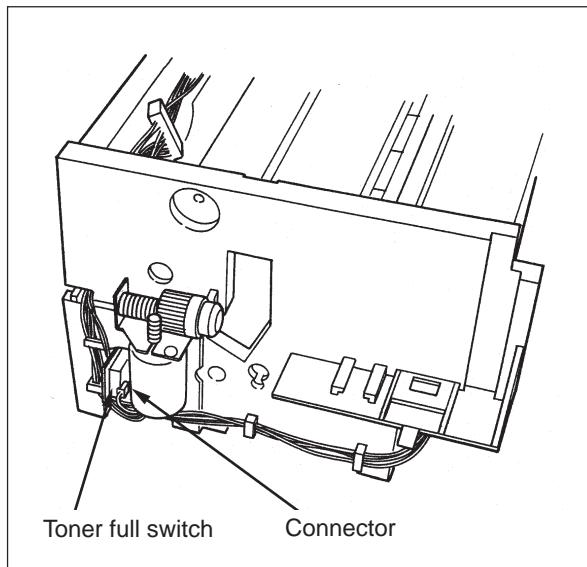


2. After installing the drum, apply power to the drum and rotate it. Refer to Sec. 11.3.1.



11.3.3 Toner full switch

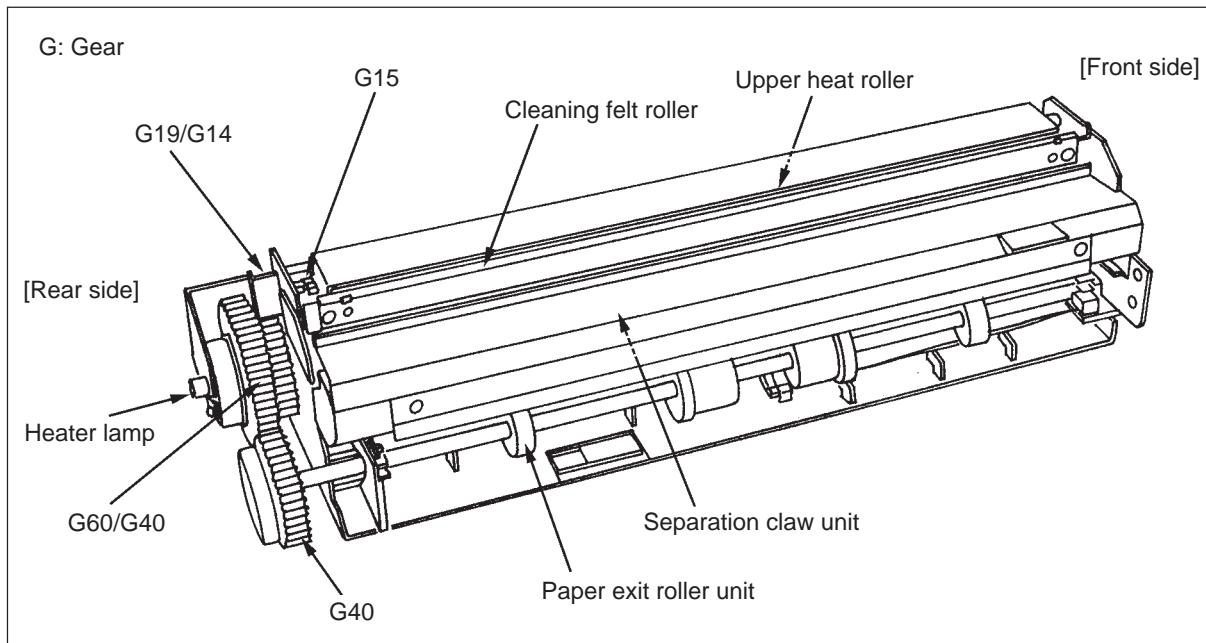
(1) Disconnect a connector.
(2) Remove the switch.



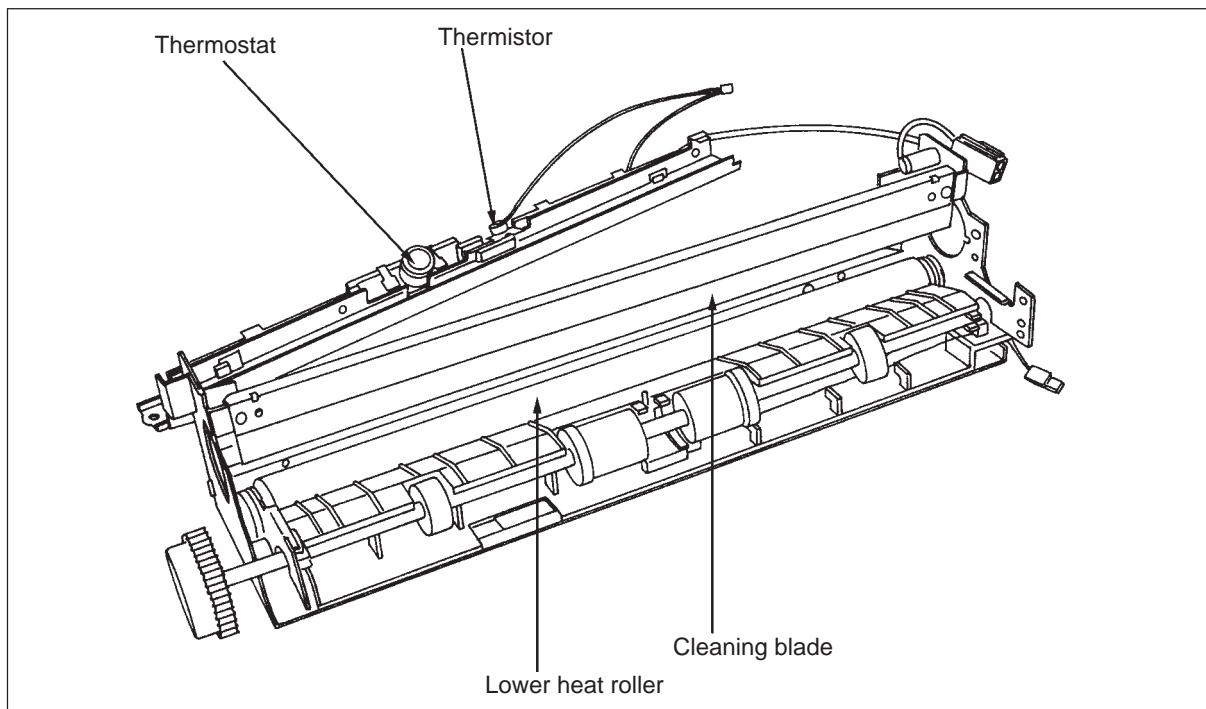
12. FUSER AND PAPER EXIT SECTION

12.1 Construction

This section consists of the upper heat roller, cleaning felt roller, paper-exit roller unit, separation claw unit, thermistor, thermostat, lower heat roller, cleaning blade, heater lamp, etc.

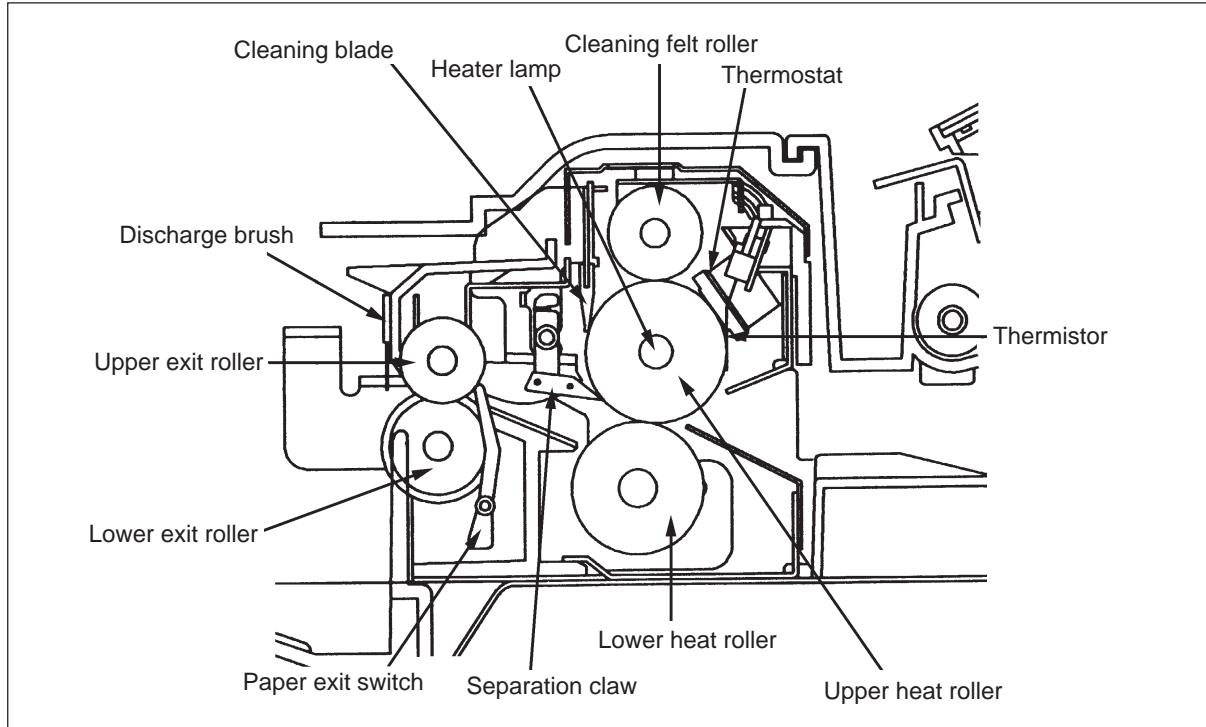


View with the fuser guard removed



View with the upper heat roller removed

12.2 Explanation of Operation



A. Fuser unit

This unit applies heat and pressure to the copy paper separated and transported from the drum to fix the toner image to the paper. The upper and lower rollers are rotated under a fixed pressure (provided by spring force) by the drive from the main motor. The upper roller has a heater lamp inside it and is rotated by the drive from the main motor but the heater lamp does not rotate.

Both the upper and lower rollers are always pressed against each other by spring force while the upper unit is closed. But when the upper unit is raised, they are released from the pressure.

The copy paper which has finished being fixed is separated smoothly from the upper heat roller with the aid of the separation claws. The temperature detection section functions to control the temperature of the upper roller (by means of a thermistor) and when it detects an abnormally high temperature, the power supply to the heater lamp is shut off (by means of a thermostat).

B. Paper exit section

The upper and lower exit rollers are rotated through gears by the drive from the fuser unit. The copy paper which has finished the fixing process is smoothly exited onto the copy tray through the upper and lower exit rollers.

The paper exit switch functions to detect whether or not the copy paper is properly exited onto the copy tray.

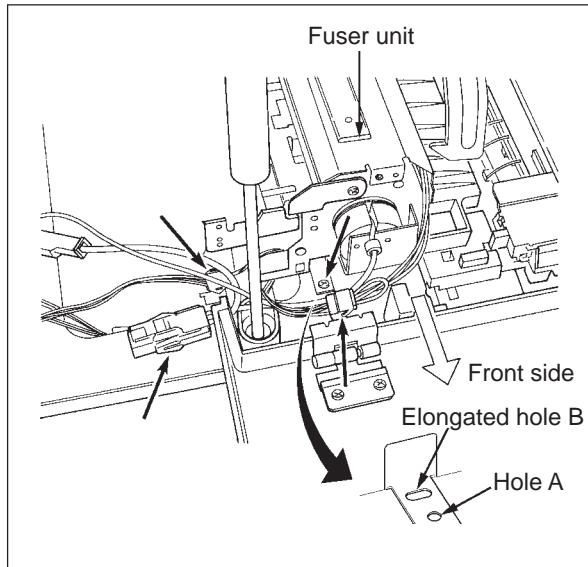
12.3 Disassembly and Replacement

12.3.1 Fuser unit

- (1) Remove the left side cover (lower) (2 screws).
- (2) Remove the inner cover (lower left) (1 screw).
- (3) Remove one screw and disconnect three connectors.
- (4) Pull out the fuser unit toward the front.

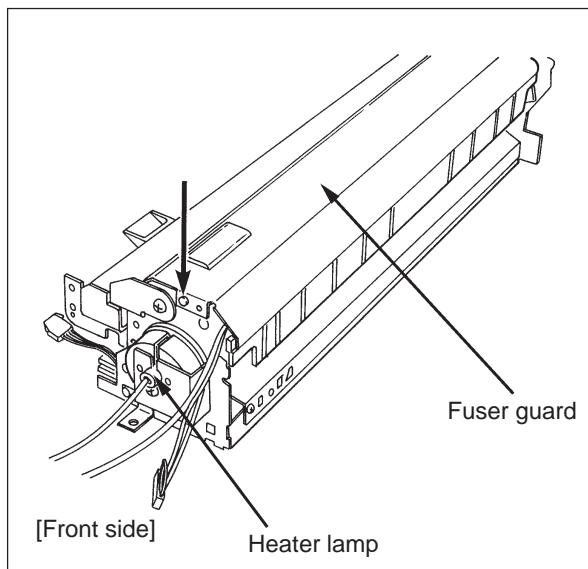
Note: The screw holding the fuser unit is tightened at the hole A at the time of shipping from the factory.

However, when tilting the fuser unit in order to correct the inclination of the straight image, retighten the screw at the elongated hole B.

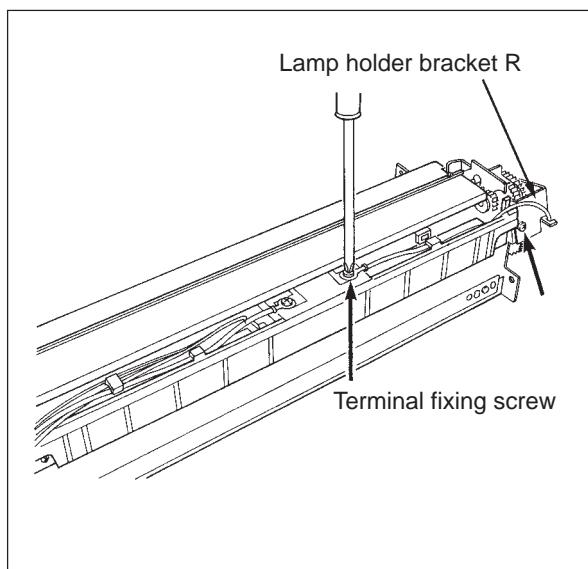


12.3.2 Heater lamp

- (1) Remove the fuser unit.
- (2) Remove the fuser guard (1 screw).

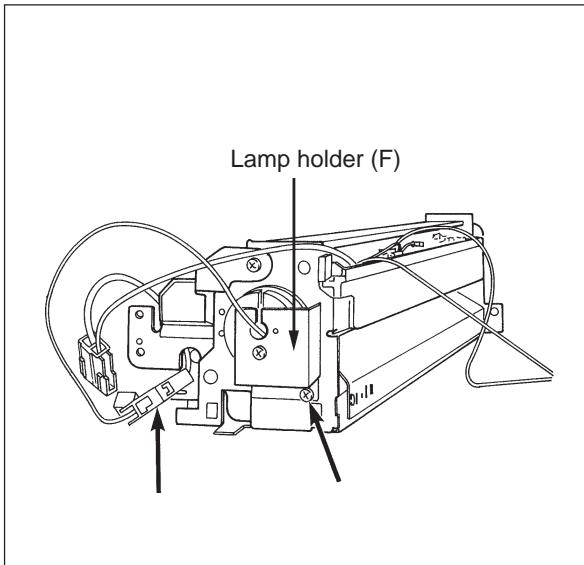


- (3) Remove the screw fastening the terminal on the rear.
- (4) Remove the lamp holder bracket (R) (1 screw).



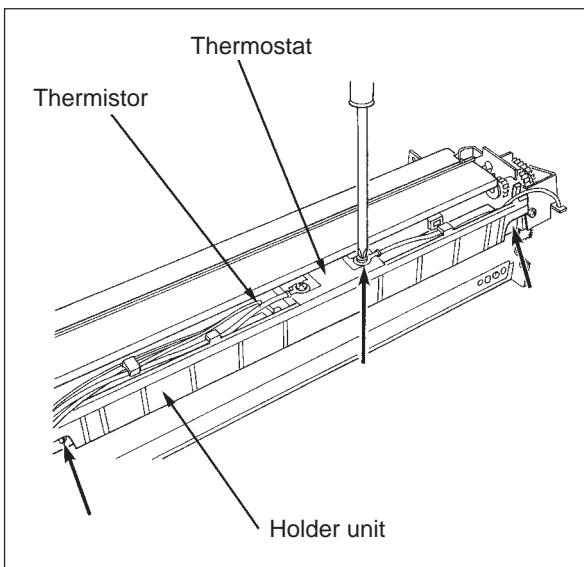
(5) Disconnect one connector and remove one screw to take out the lamp holder (F).

Notes: 1. When replacing the lamp, don't touch it with a bare hand.
2. Be careful so that the Toshiba mark is on the front side.



12.3.3 Thermostat, thermistor and brush

- (1) Remove the fuser unit.
- (2) Remove the fuser guard.
- (3) Remove the rear screw of the thermostat.
- (4) Remove the holder unit (2 screws).



Thermostat:

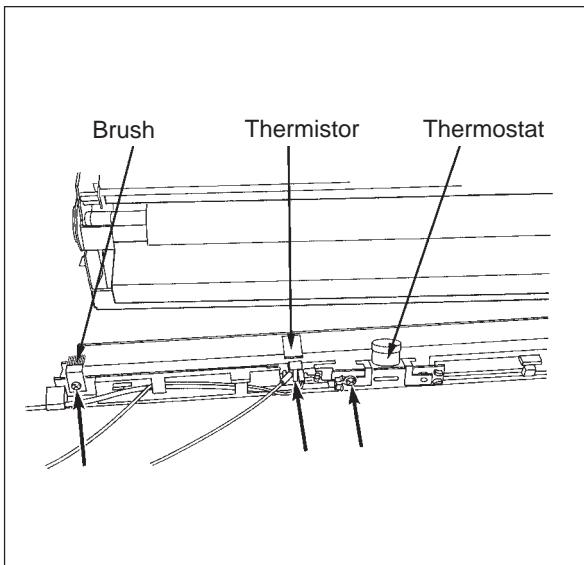
- Remove one screw to take it out.

Thermistor:

- Remove one screw to take it out.

Brush:

- Remove one screw to take it out.



12.3.4 Cleaning felt roller and cleaning blade

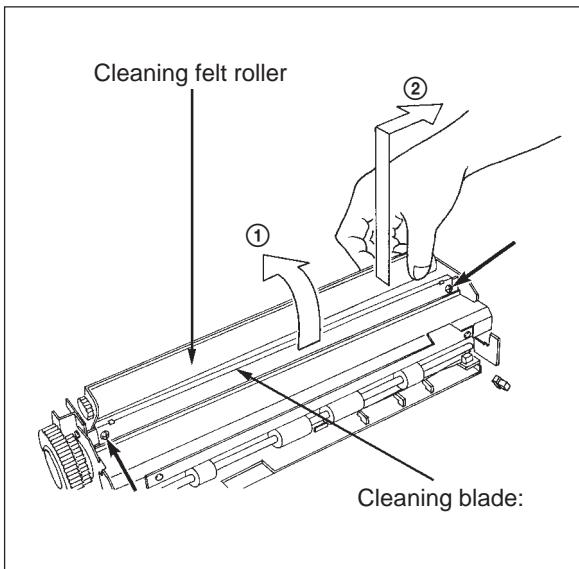
- (1) Remove the fuser unit.
- (2) Remove the fuser guard.

Cleaning felt roller:

- Lifting the front side, take out the whole roller unit upward (①→②).

Cleaning blade:

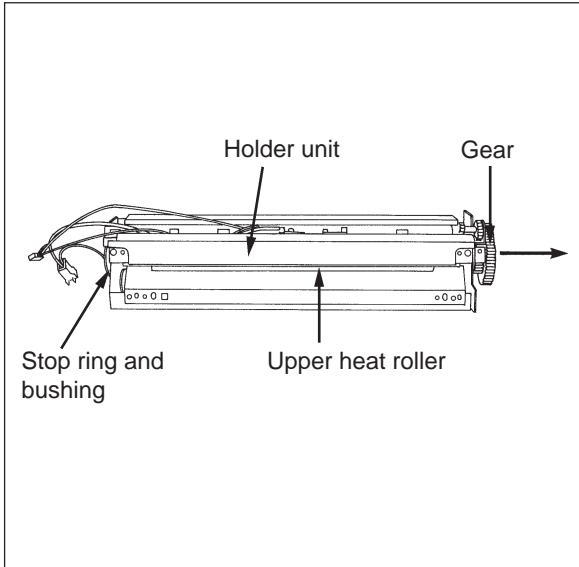
- Remove two screws to take out the roller.



12.3.5 Upper heat roller

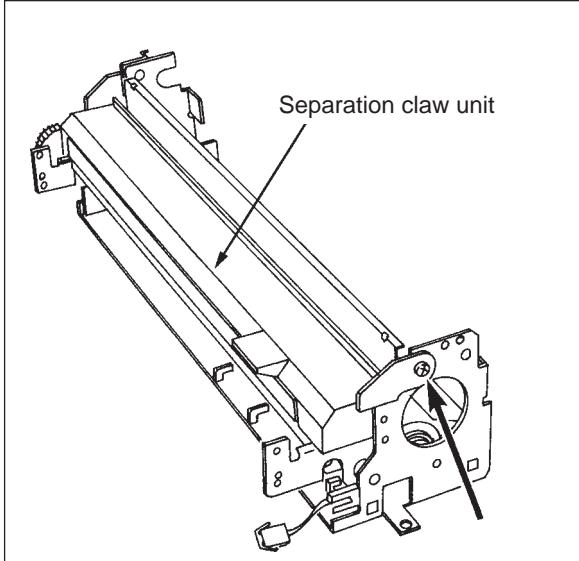
- (1) Take out the heater lamp.
- (2) Remove the holder unit (2 screws).
- (3) Remove the stop ring and bushing on the front and then pull out the roller along with its gear toward the rear.

Note: While replacing the roller, be careful not to damage the roller surface with metal-plate edges or be careful not to deform or damage the separation claws.

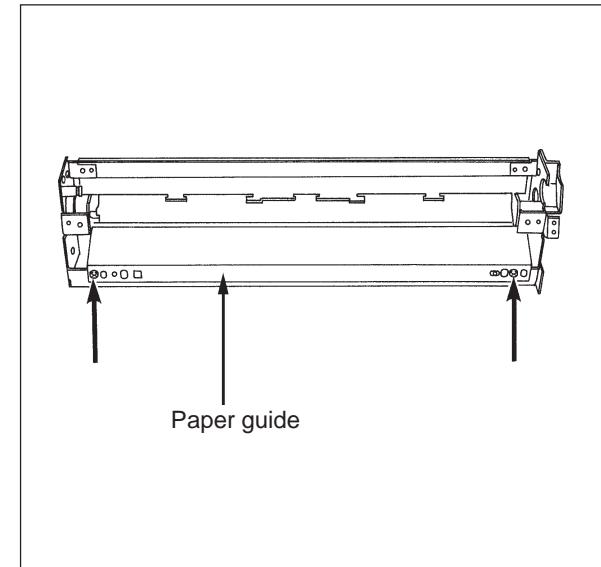


12.3.6 Lower heat roller

- (1) Remove the upper heat roller.
- (2) Remove the separation-claw unit (1 screw).

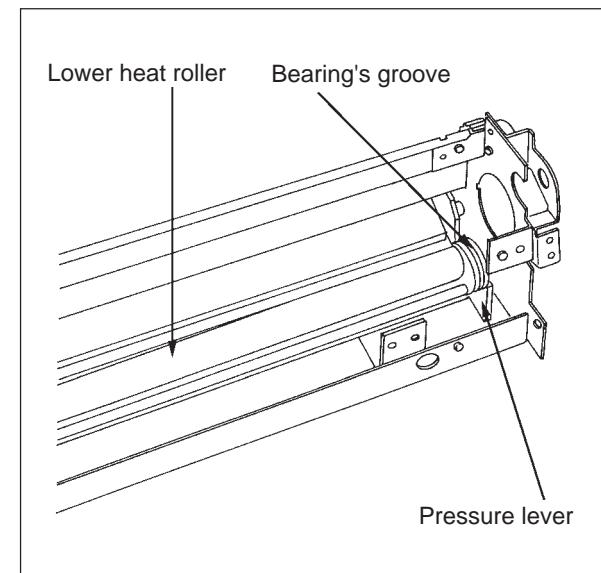


(3) Remove the paper guide (2 screws).



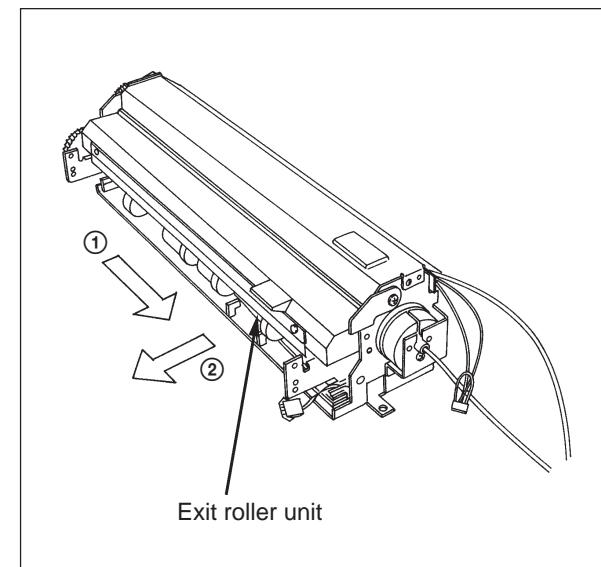
(4) Placing your finger tip on each side of the roller, take out the roller along with the bearings upward.

Note: After setting the lower heat roller in the machine, check to make sure that the pressure levers are fitted in the bearing grooves (at the front and rear).



12.3.7 Lower exit roller and paper exit switch

- (1) Take out the fuser unit.
- (2) Slide the exit roller unit to the front and then take it out toward you (①→②).

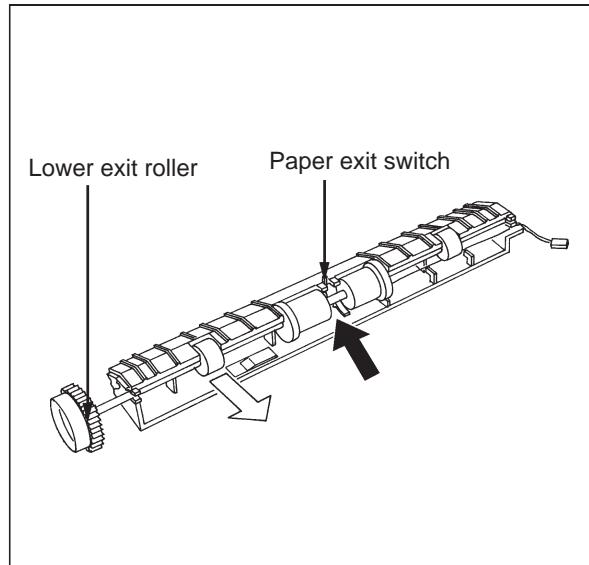


Lower exit roller:

- Take it out in the direction of the arrow.

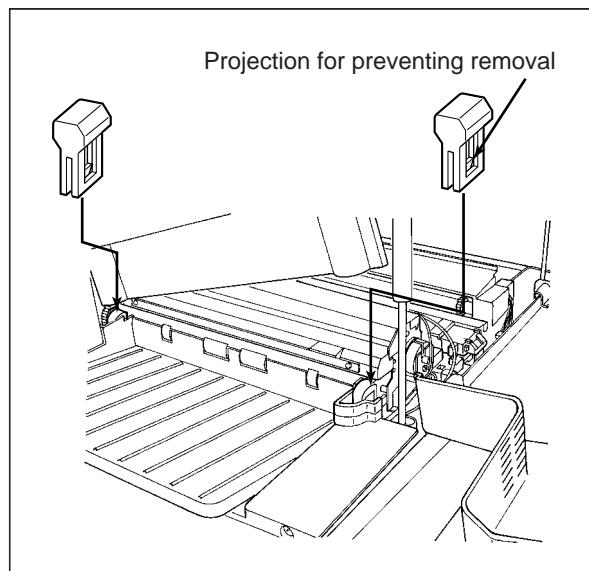
Paper exit switch:

- Remove one screw.



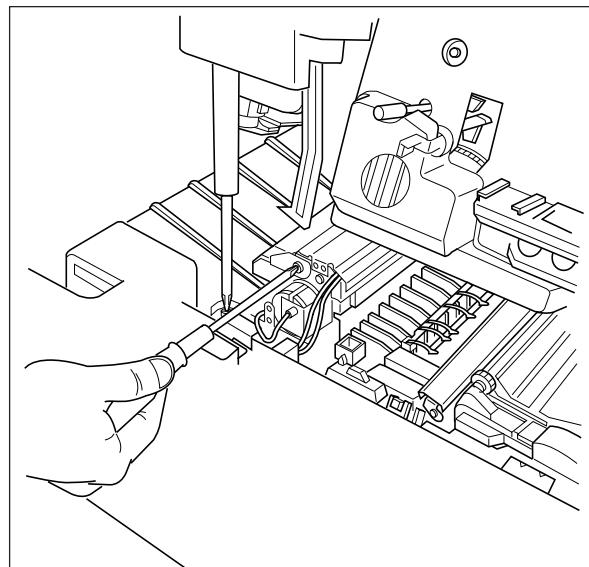
12.3.8 Lever caps

When installing the lever caps, pay attention to their orientations: The projection for preventing removal of each lever cap should face front side.

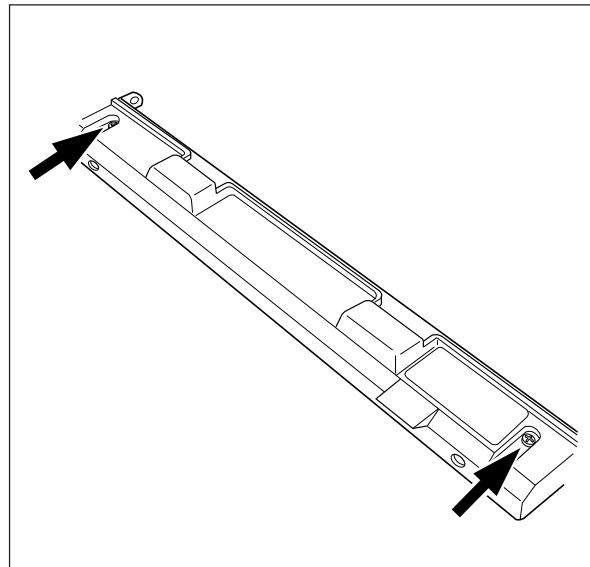


12.3.9 Separation claws (6)

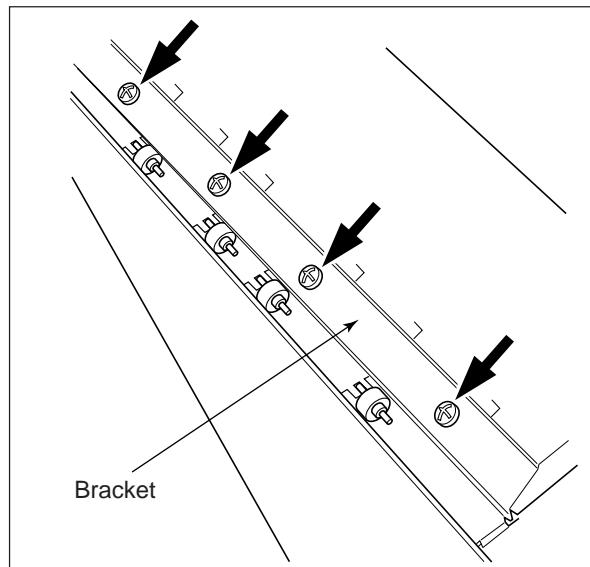
- (1) Remove the inner cover (lower left) (1 screw).
- (2) Remove the separation claw unit (1 screw).



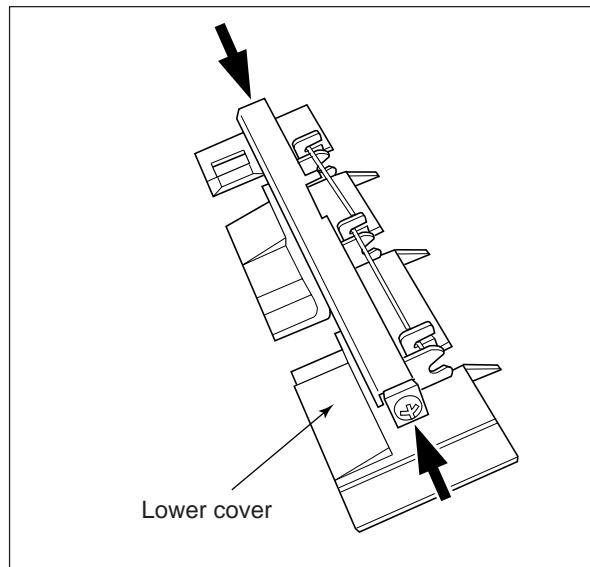
(3) Remove the upper cover of the separation claw unit (2 screws).



(4) Remove the bracket from the separation claw unit (4 screws).



(5) Remove the lower cover (4 screws). (1 unit : screws 2x2) Take off the six claws from the claw holder.



12.4 Heater Control Circuit

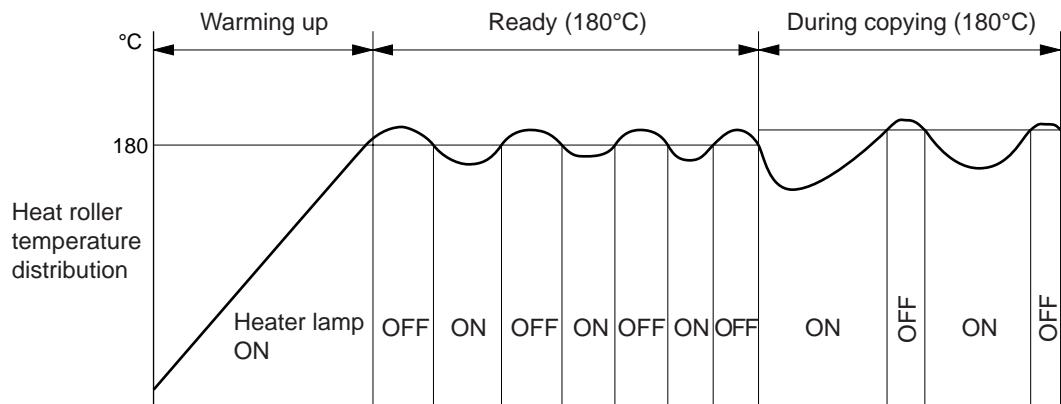
(1) Temperature detection unit

In order to control the temperature of the heat roller, the temperature detector unit detects the heat-roller temperature with a thermistor and ON/OFF controls the heater lamp. Heat roller surface temperature 180°C (thermistor resistance value: 7.4 KΩ approx.)

Reference

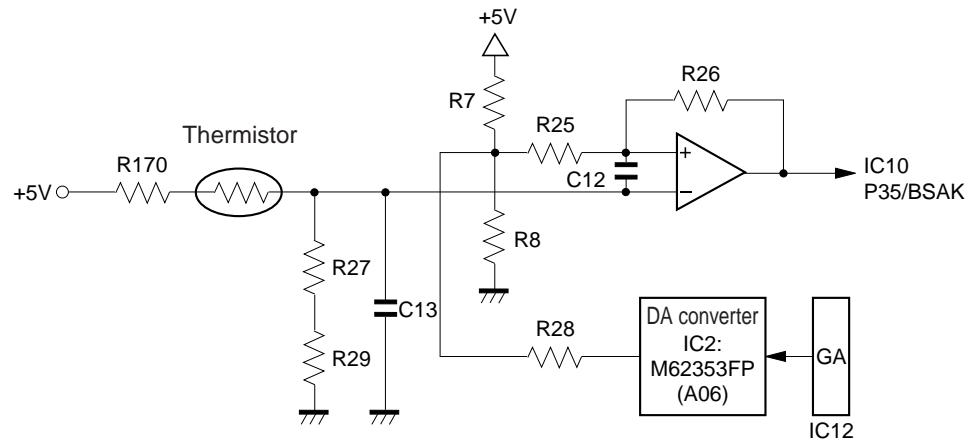
Relationship between heat roller surface temperature and thermistor resistance value.

Temperature	Thermistor resistance	Heater lamp state
Less than 180°C	More than 7.4 KΩ	ON
180°C	7.4KΩ	Maintains previous state
More than 180°C	Less than 7.4 KΩ	OFF



(2) Thermistor disconnection detection

- Resistance value of thermistor changes → Input voltage changes
- Input voltage can be obtained by dividing the pressure of R170, thermistor, R27 and R29.
- The main CPU detects the changes and judges whether the thermistor is normal or not.

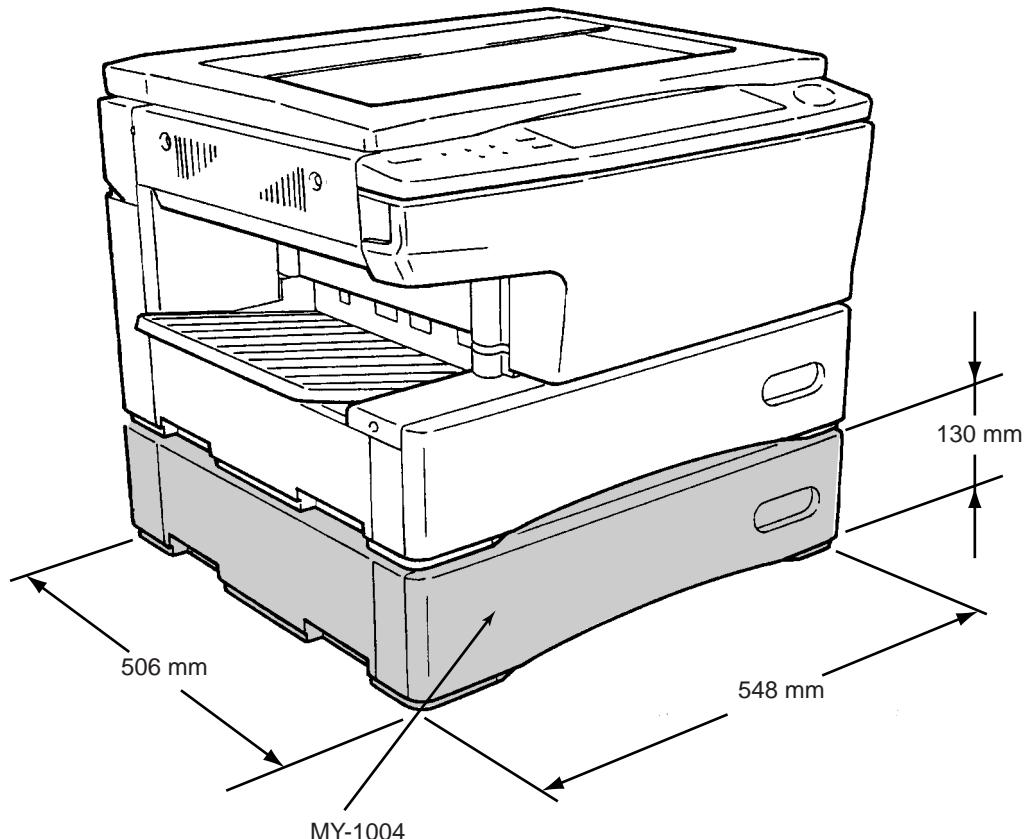


13. OPTIONAL PAPER FEEDING UNIT (MY-1004)

13.1 Specifications

Model Name	Paper feeding unit (PFU) MY-1004
Number of Cassette	One
Cassette Capacity	500 sheets (50mm or less)
Paper Size	A3 – A5-R Ledger – Statement-R
Paper Weight	64 – 80 g/m ² 17 – 22 lbs.
Dimensions	W 548 x D 506 x H 130 mm W 21.6" x D 19.9" x H 5.1"
Weight	8 kg 18 lbs.
Power Source	Supplied from the copier
Factory-Set Size	A3 for Europe (User adjustable) Ledger for USA/Canada (Serviceman adjustable)

Note: Specifications are subject to change without notice.

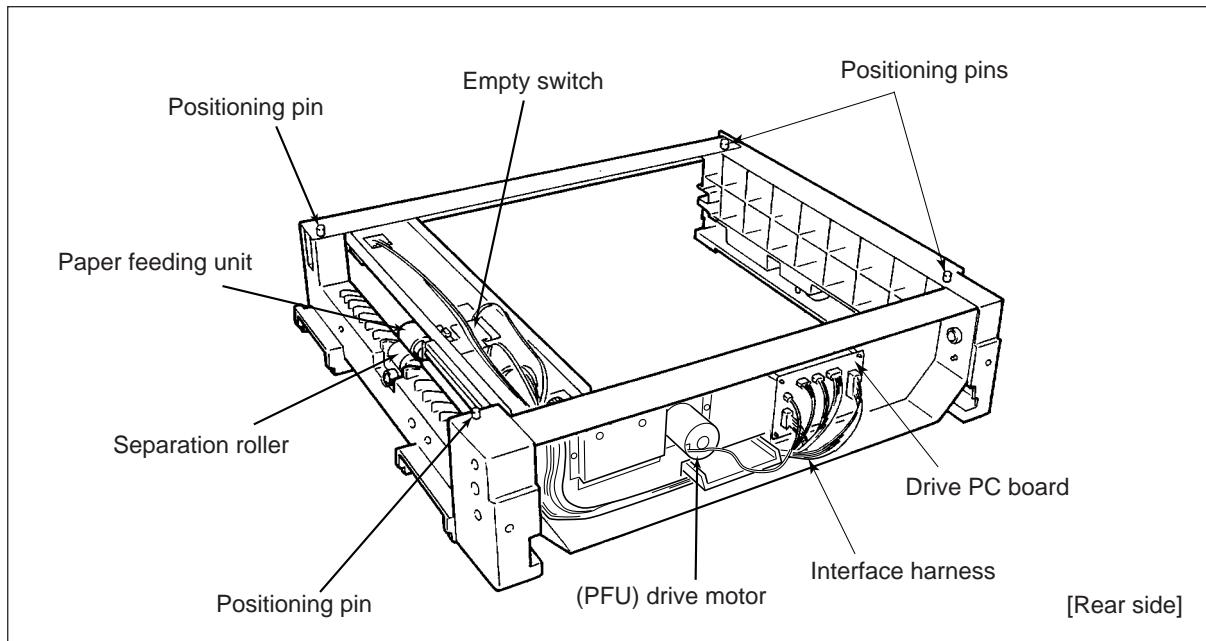


13.2 General Description

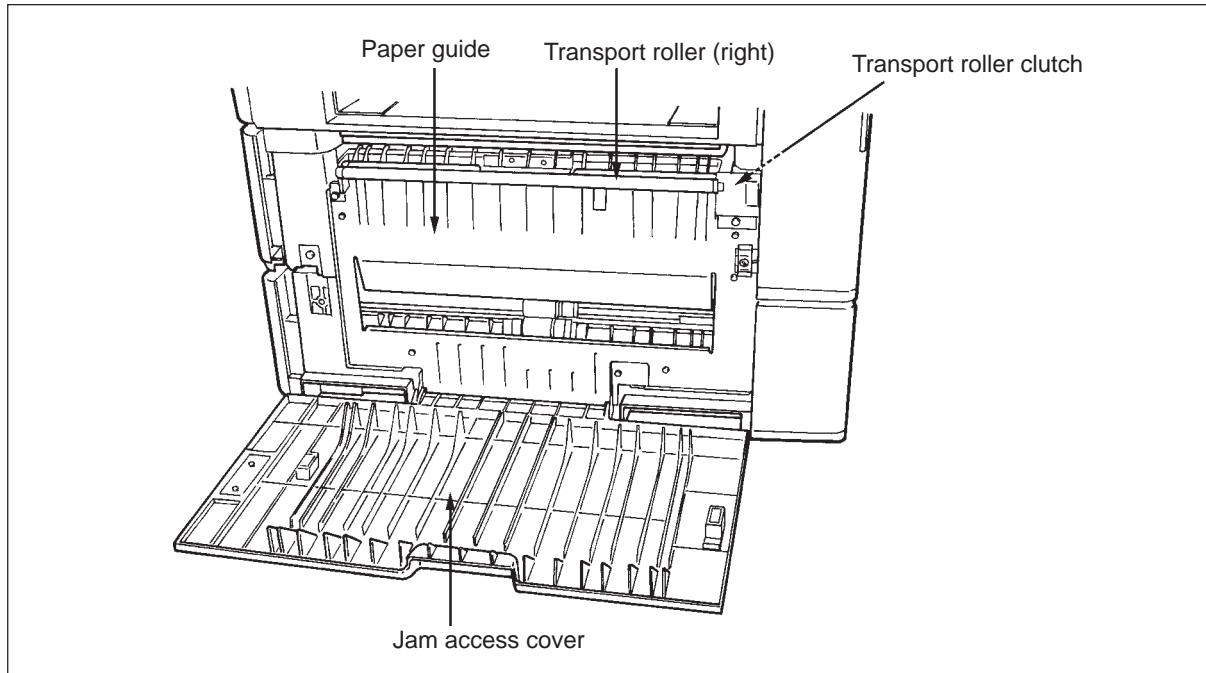
13.2.1 Front sectional view Refer to P2-1.

13.2.2 Rear side view Refer to P2-2.

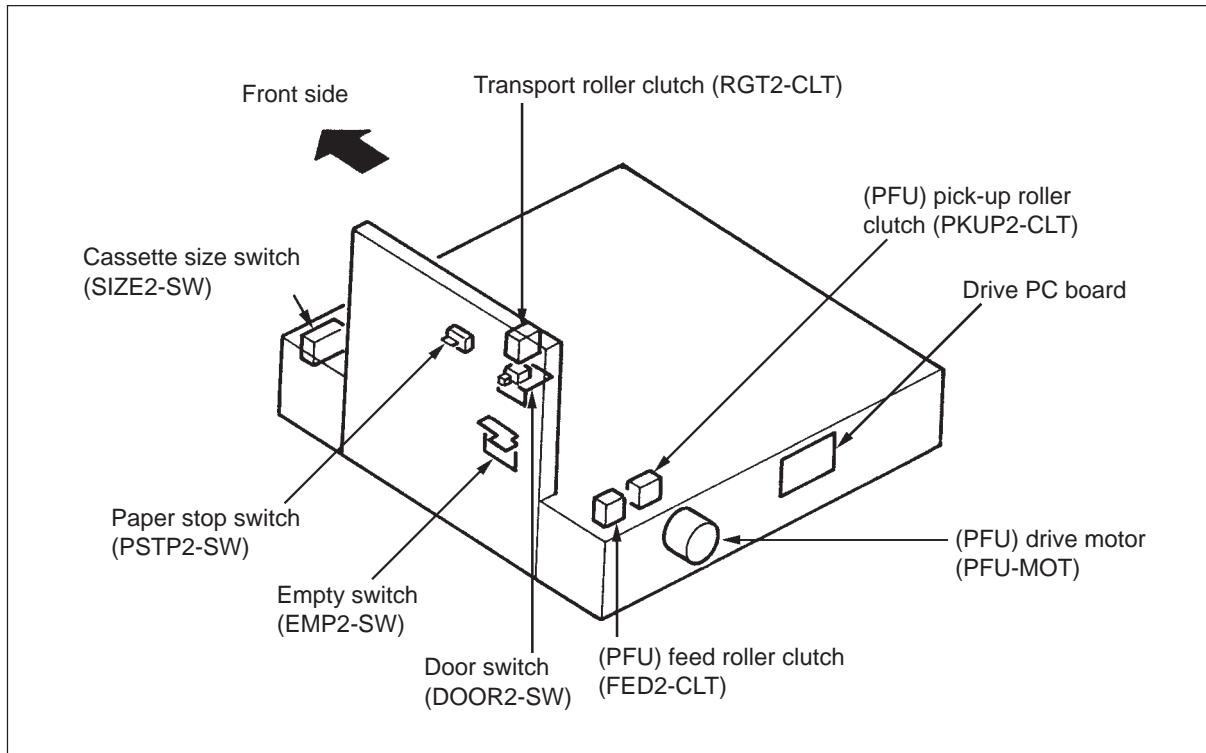
13.2.3 Names of the main components



View with the rear cover and cassette removed



13.2.4 Electrical parts location diagram



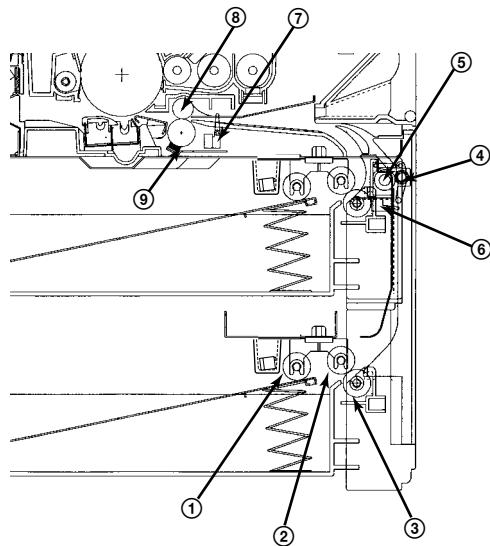
13.2.5 Symbols and functions of electrical parts

*Refer to SERVICE PARTS LIST MY-1004

Symbol	Name	Function	Remarks	*Page/item No.
(M10)	PFU-MOT (Drive motor)	Drives the pick-up and feed rollers.	—	P2, I18
(CLT4)	RGT2-CLT (Transport roller clutch)	Controls the rotation of the transport roller.	—	P3, I5
(CLT6)	PKUP2-CLT (Pick-up roller clutch)	Controls the rotation of the pick-up roller.	—	P2, I4
(CLT5)	FED2-CLT (Feed roller clutch)	Controls the rotation of feed roller.	—	P2, I4
(S15)	PSTP2-SW (Paper stop switch)	Detects the paper fed from the cassette. It also detects when the feed clutch is turned OFF.		P3, I7
(S16)	EMP2-SW (Empty switch)	Detects when the cassette runs out of paper.	Reflective-type photosensor	P2, I16
(S17)	DOOR2-SW (Door switch)	Detects whether or not the cover is open.		P3, I13
(S18)	SIZE2-SW (Cassette size switch)	Detects the cassette size or whether the cassette is installed or removed.		P2, I30

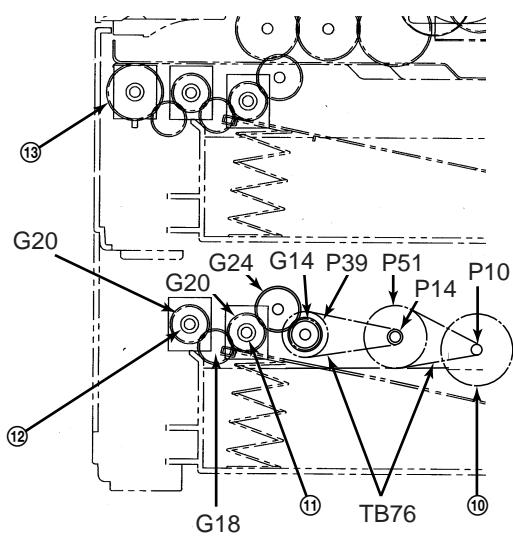
13.3 Functions and Operation

13.3.1 Paper feeding operation



View as seen from the front

① Pick-up roller	② Paper feed roller	③ Separation roller	④ Transport roller (right)
⑤ Transport roller (left)	⑥ Paper stop switch	⑦ Aligning switch	⑧ Aligning roller (upper)
⑨ Aligning roller (lower)			



View as seen from the rear

⑩ Drive motor	⑪ Pick-up roller clutch	⑫ Feed roller clutch	⑬ Transport roller clutch
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When the **PRINT** key is pressed, sheets of paper start being fed from the paper feeding unit (PFU) in the sequence described below:

- (1) About 0.1 sec. later, the drive motor (M10) ⑩ is energized, causing the pick-up roller ① and paper feed roller ② to rotate. The pick-up roller is rotated through the pick-up roller clutch (CLT6) ⑪. The paper feed roller is rotated through the feed roller clutch (CLT5) ⑫ and the transport rollers are rotated through the transport roller clutch (CLT4) ⑬.
(The transport rollers are driven by copier's main motor).
- (2) The top sheet of paper in the cassette is fed out by the pick-up roller to the paper feed roller which separates the top sheet from other sheets if more than one sheet has been fed out and sends only the top sheet to the transport roller. When this sheet turns on the paper stop switch ⑥ located under the transport roller, the feed roller clutch ⑫, pick-up roller clutch ⑪ and drive motor are deenergized, causing the pick-up and paper feed rollers to stop.
- (3) At this time, if the copier's aligning switch ⑦ is off, the transport roller clutch maintains an on-status until this switch is turned on. But if the copier's aligning switch is on, the transport roller clutch is deenergized, causing the rollers to stop.
- (4) When the copier's aligning roller is turned off, transport roller clutch is turned on, the rollers start rotating again. At this time, since the feed roller clutch ⑫ is off, only the transport roller is rotated, sending the sheet fed from the cassette into the copier.
- (5) After the sheet turns on the copier's aligning switch and is aligned by the copier's aligning rollers ⑧ and ⑨, the transport roller clutch is deenergized, causing the rollers to stop.
- (6) After the first sheet's trailing edge has passed the paper stop switch ⑥ to turn it off, when the paper feeding unit (PFU) receives the next paper feed signal from the copier, the above sequence of operation will be repeated.

13.3.2 Detection and clearing of paper jams

- (1) Within 1.238 sec. after a sheet of paper is fed, if its leading edge does not arrive at the paper stop switch ⑥, the jam detection device of the paper feeding unit (PFU) activates to turn off the drive motor ⑩, pick-up roller clutch ⑪ and feed roller clutch ⑫.

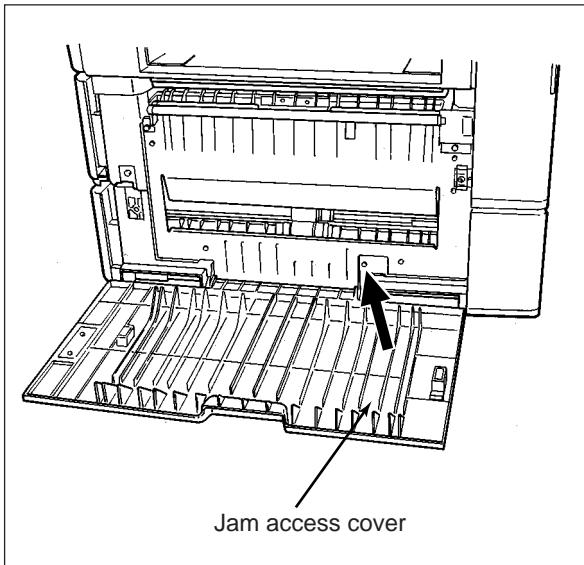
- (2) To clear the paper jam condition, you open the cover of the paper feeding unit (PFU), remove the jammed paper and close the cover. At this time, if the paper stop switch ⑥ continues to be turned on, PFU decides that paper still remains in it and does not clear the paper jam status.
- (3) During multicopying from the paper feeding unit (PFU), if a paper jam occurs inside the PFU, all the sheets of paper fed before the jammed sheet will be processed normally.

13.4 Disassembly and Replacement

13.4.1 Covers and paper guide

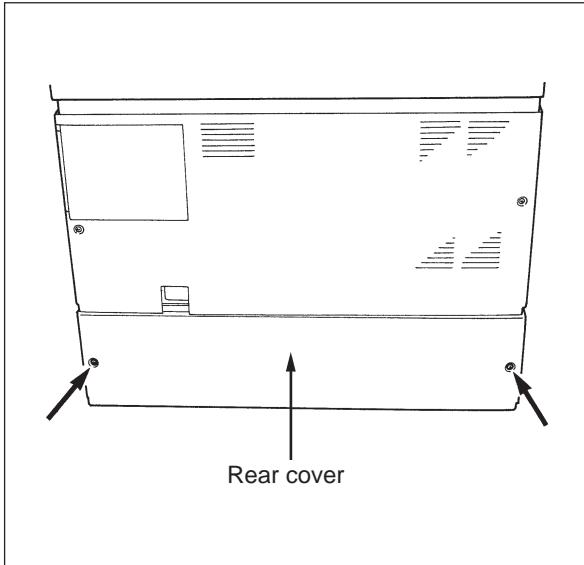
[A] Jam access cover

- (1) Open the jam access cover.
- (2) Loosen the screw and take out the cover.



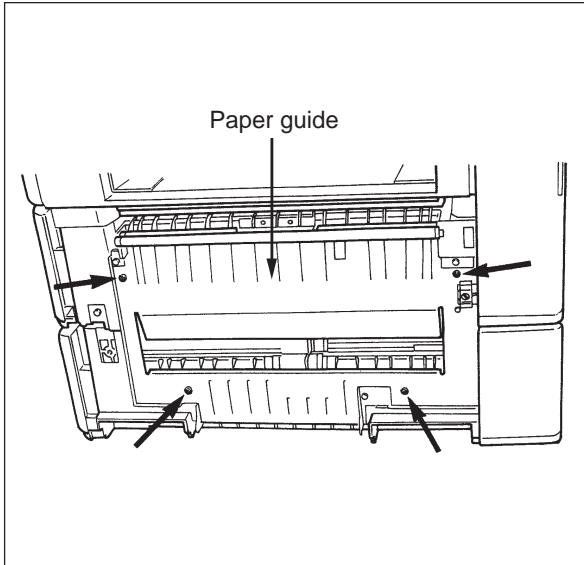
[B] Rear cover

- (1) Remove two screws to take out the cover.

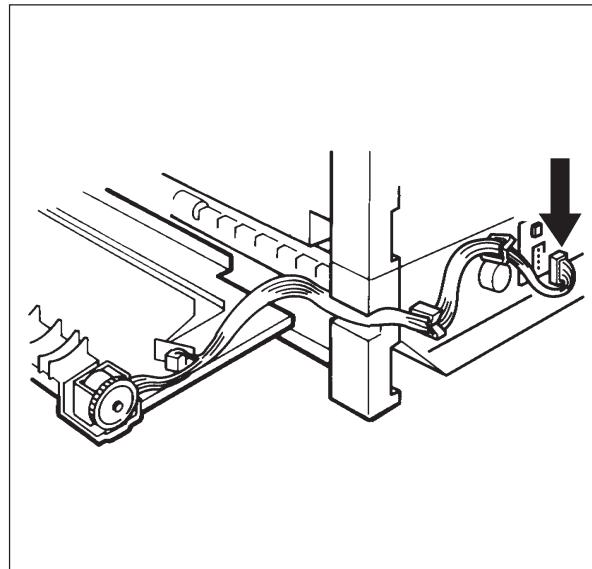


[C] Paper guide

- (1) Remove the jam access cover.
- (2) Remove four screws.

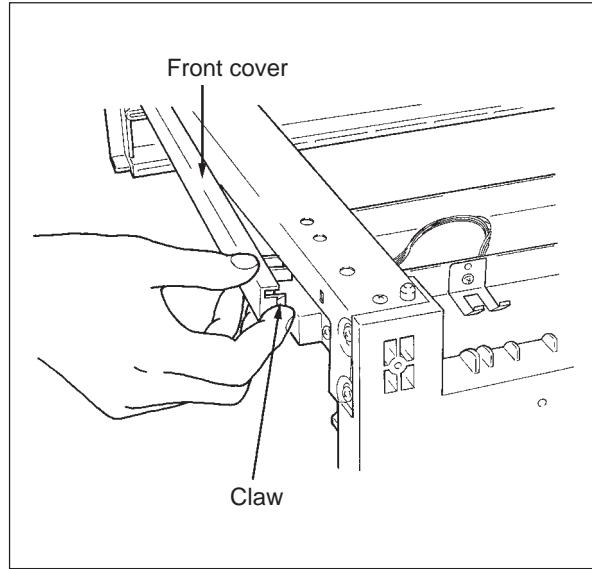


(3) Disconnect one connector to take out the guide.



[D] Front cover

- (1) Remove the cassettes of both the copier and the paper feeding unit.
- (2) Unhook the right and left claws of the front cover.



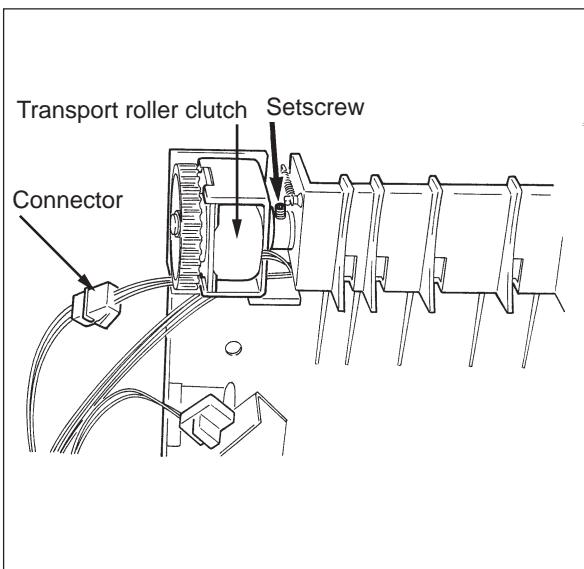
View with copier taken off

13.4.2 Transport rollers (right)/(left), paper stop switch, transport roller clutch and door switch

- (1) Remove the paper guide.

Transport roller clutch:

- (1) Disconnect one connector.
- (2) Loosen one setscrew.

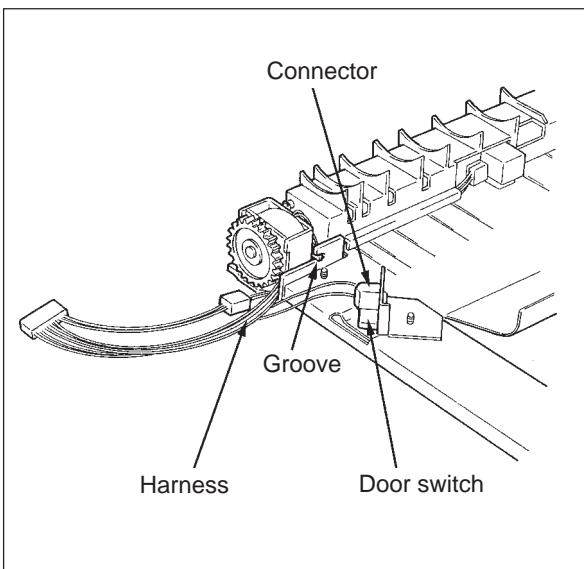


Notes:

1. When reassembling the clutch, fit the clutch's projection into the groove shown securely and fasten the setscrew.
2. The clutch harness should be passed under the clutch as shown.

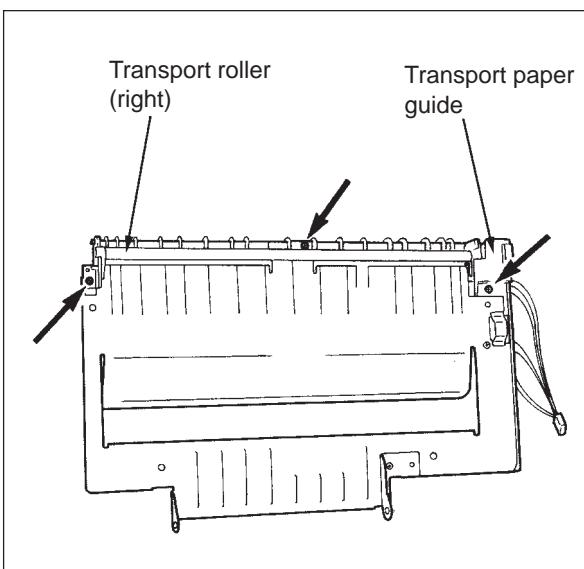
Door switch:

- (1) Disconnect its connector, unhook its claws and the switch can be taken out.



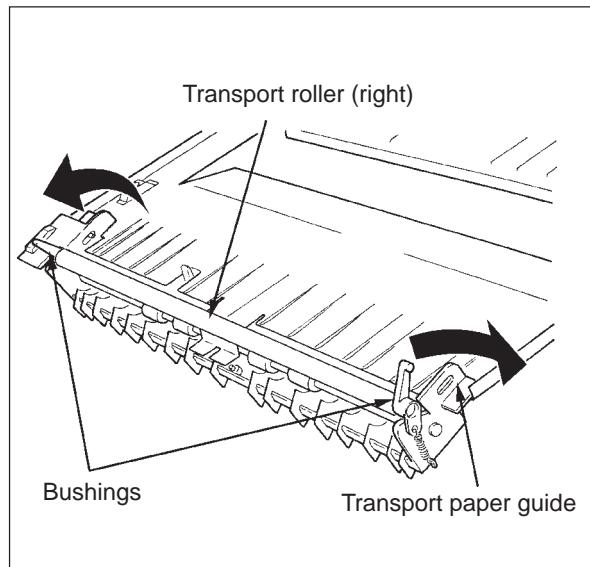
Transport rollers (right)/(left) and paper stop switch:

- (1) Remove the transport roller clutch.
- (2) Remove the transport paper guide (3 screws).



(3) While bending the transport guide in the direction of the arrow, remove the bushings from the frame

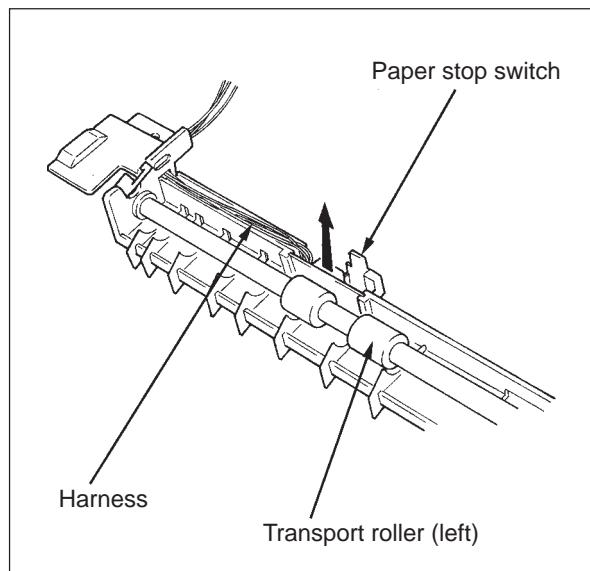
..... both front and rear, and the transport roller (right) can be taken out along with the bushings.



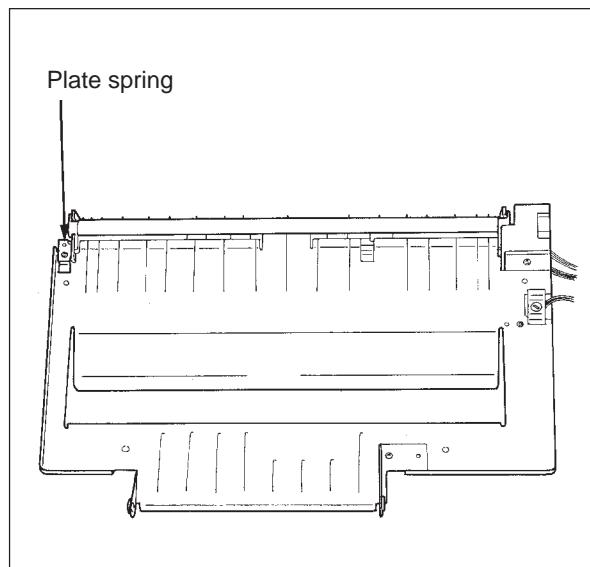
(4) Take out the bushings and the transport roller (left).

(5) Take out the paper stop switch along with the guide.

Notes: 1. During reassembly, fit the switch harness into the groove securely.
2. When reassembling the switch, pay attention to its orientation.



3. When reinstalling the transport paper guide, make sure that the plate spring is in contact with the shaft of the transport roller (right) securely.

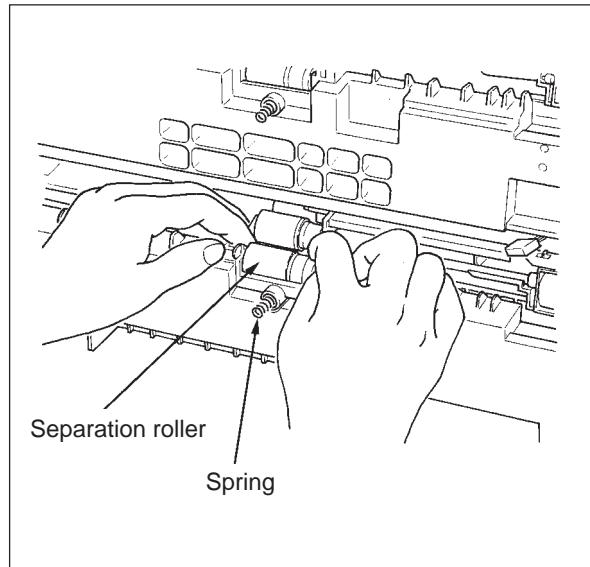


13.4.3 Separation, pick-up and feed rollers

- (1) Remove the cassette.
- (2) Remove the paper guide.

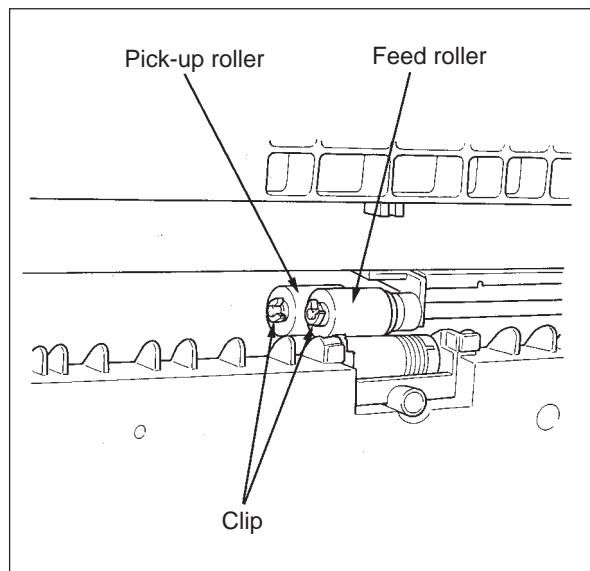
Separation roller:

- (1) It can be taken out if you pull it toward you.



Pick-up and feed rollers:

- (1) Snap off the clips and slide out the pick-up roller from its shaft. The feed roller can be removed by the same procedure.

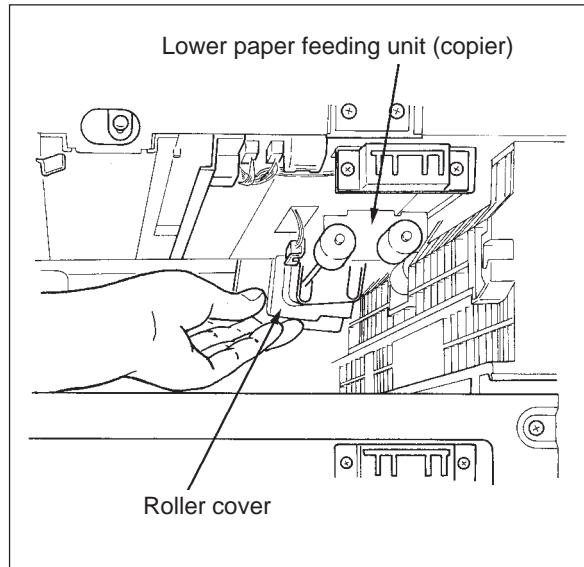


Note: The separation, pick-up and feed rollers are the same parts as used in the copier.

Caution: During disassembly or reassembly, be careful not to lose the spring.

13.4.4 Lower paper feeding unit

- (1) Remove the copier's cassette and the paper feeding unit's cassette.
- (2) Remove the roller cover (on the copier side) of the paper feeding unit.

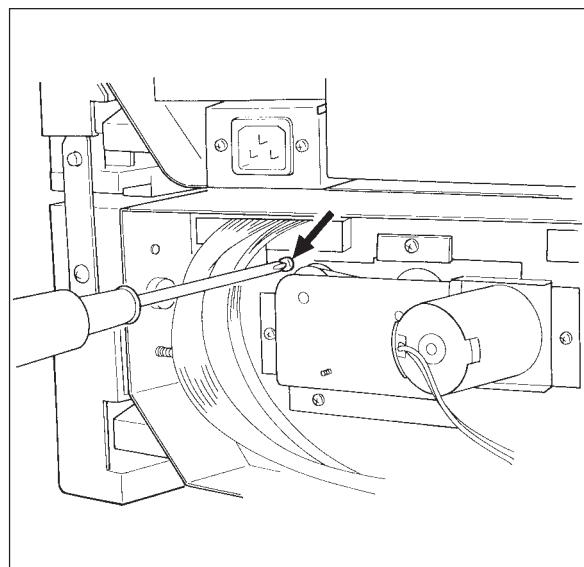


- (3) Remove one screw from the lower paper feeding unit.



- (4) Remove the feed roller.
- (5) Remove the rear cover.
- (6) Remove one screw and then take out the whole unit toward the front.

Note: Since the disassembly and replacement procedures for the pick-up roller clutch, feed roller clutch and pick-up roller are the same as for those of the copier, refer to para. 8.3.2.



13.4.5 Drive motor and drive PC board

(1) Remove the rear cover.

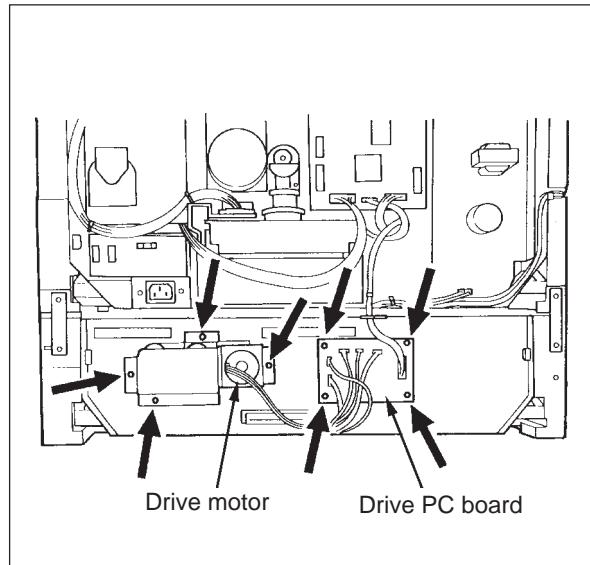
Drive PC board:

(1) After disconnecting six connectors, remove the PC board from its four lock supports.

Drive motor:

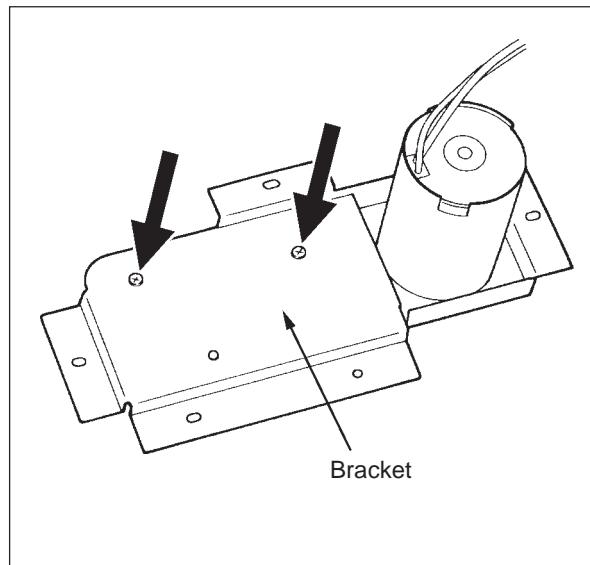
(1) Disconnect one connector from the drive PC board.

(2) Remove four screws and take out the motor assembly.



(3) Remove the bracket (2 screws).

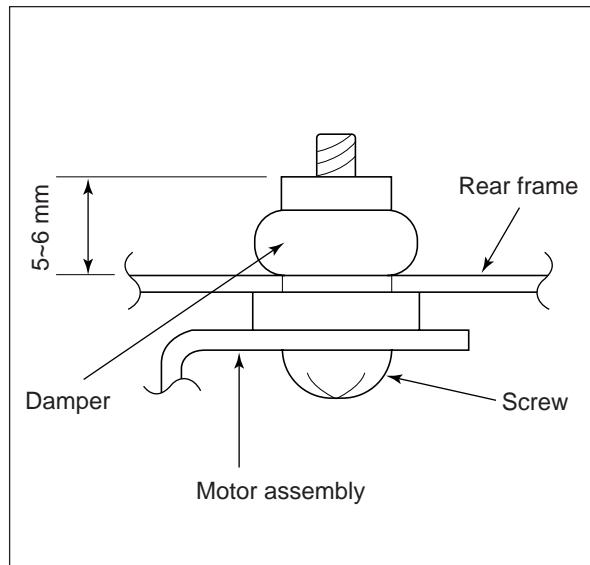
(4) Remove three screws.



Note: When installing the motor assembly to the rear frame, take the following precaution.

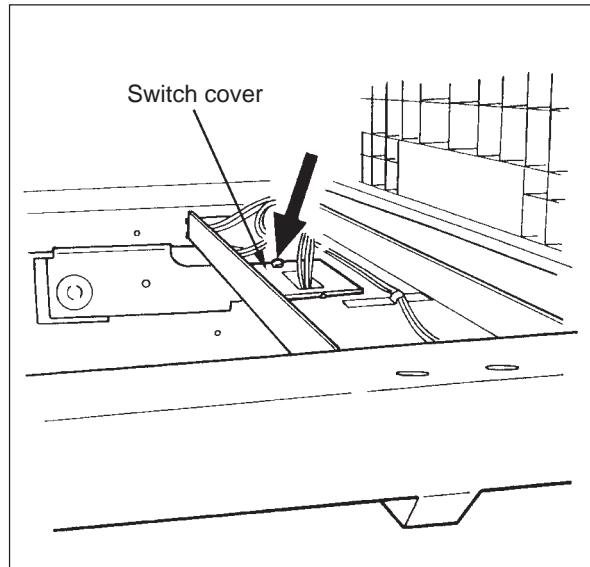
Tighten respective screws so that the front edge of the damper should be down by 5~6 mm from the frame surface.

(Overtightening can damage the damper.)

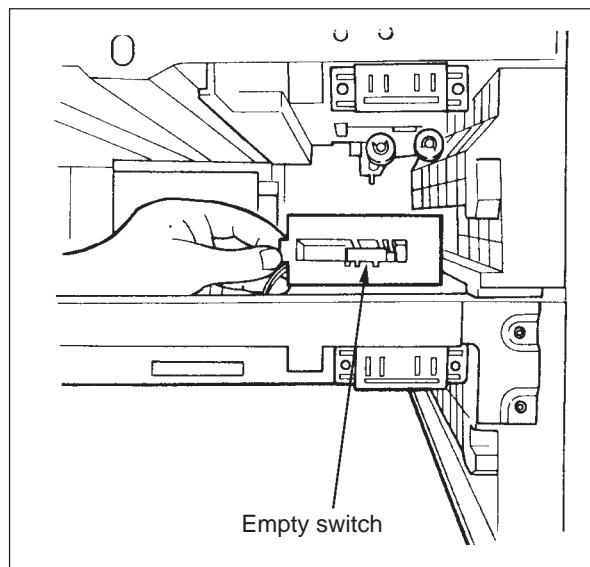


13.4.6 Empty switch

- (1) Pull out the cassettes from both the copier and the paper feeding unit.
- (2) Remove one screw and take out the switch along with the cover.

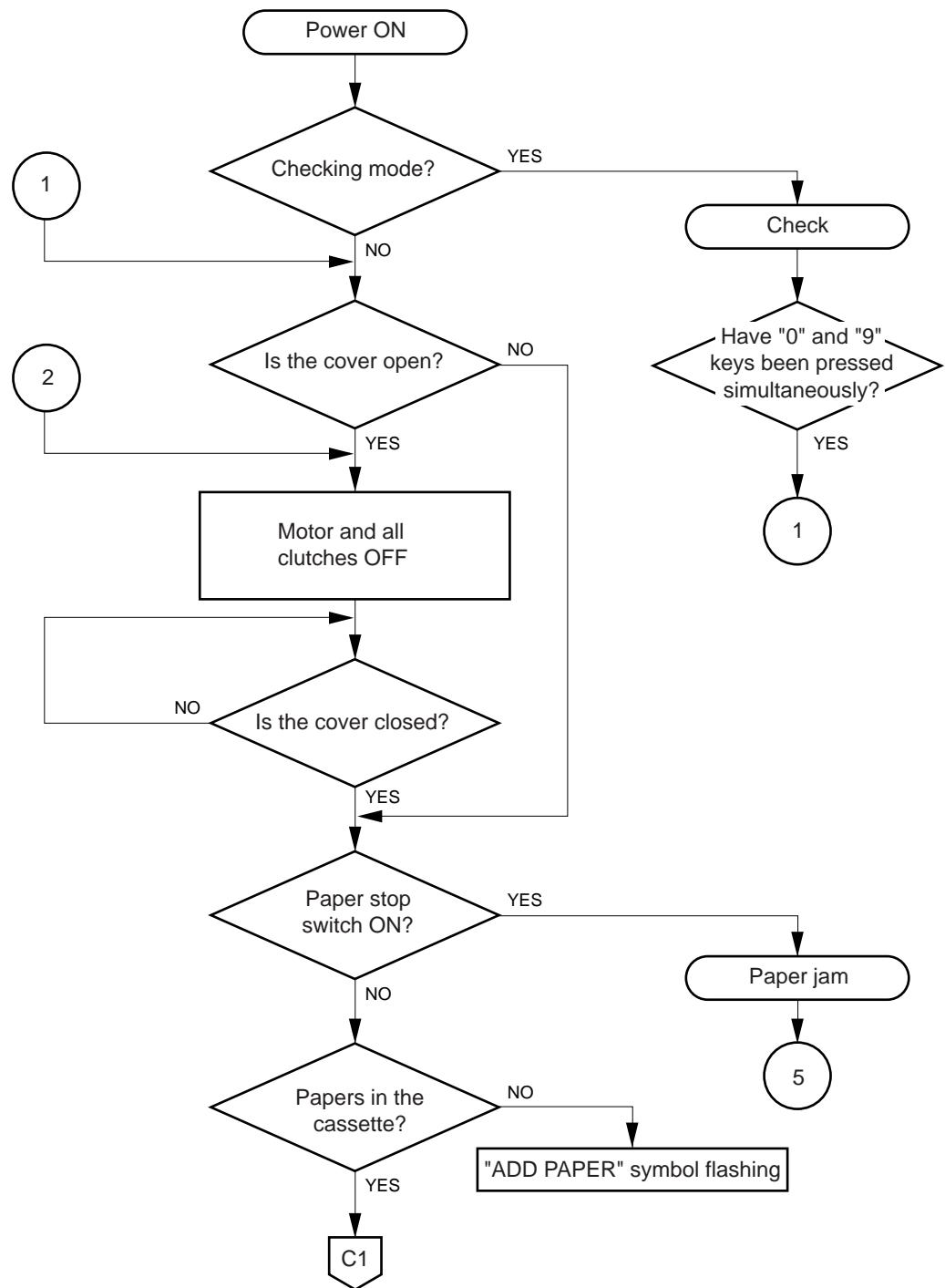


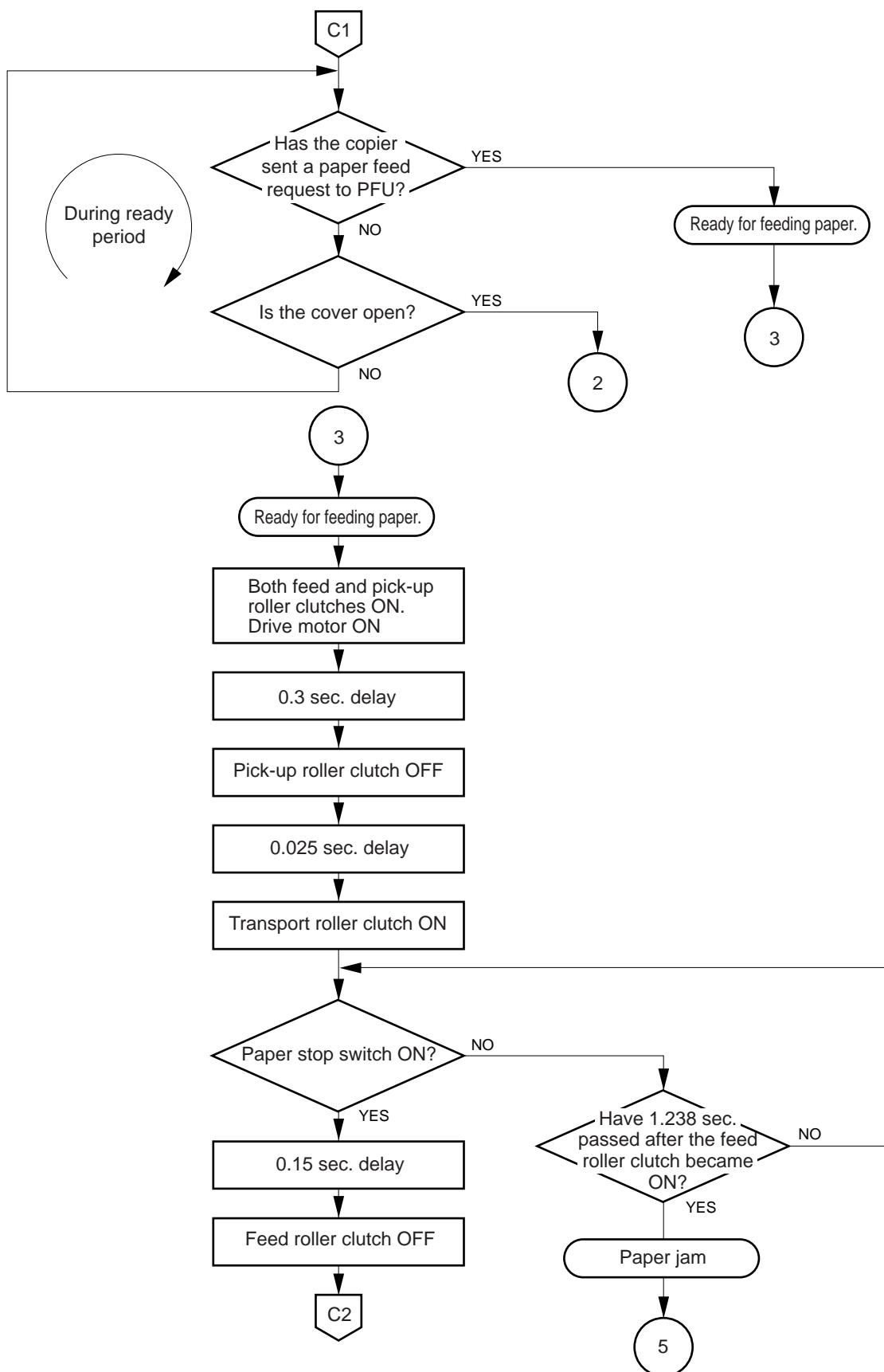
- (3) Detach the switch from the cover.

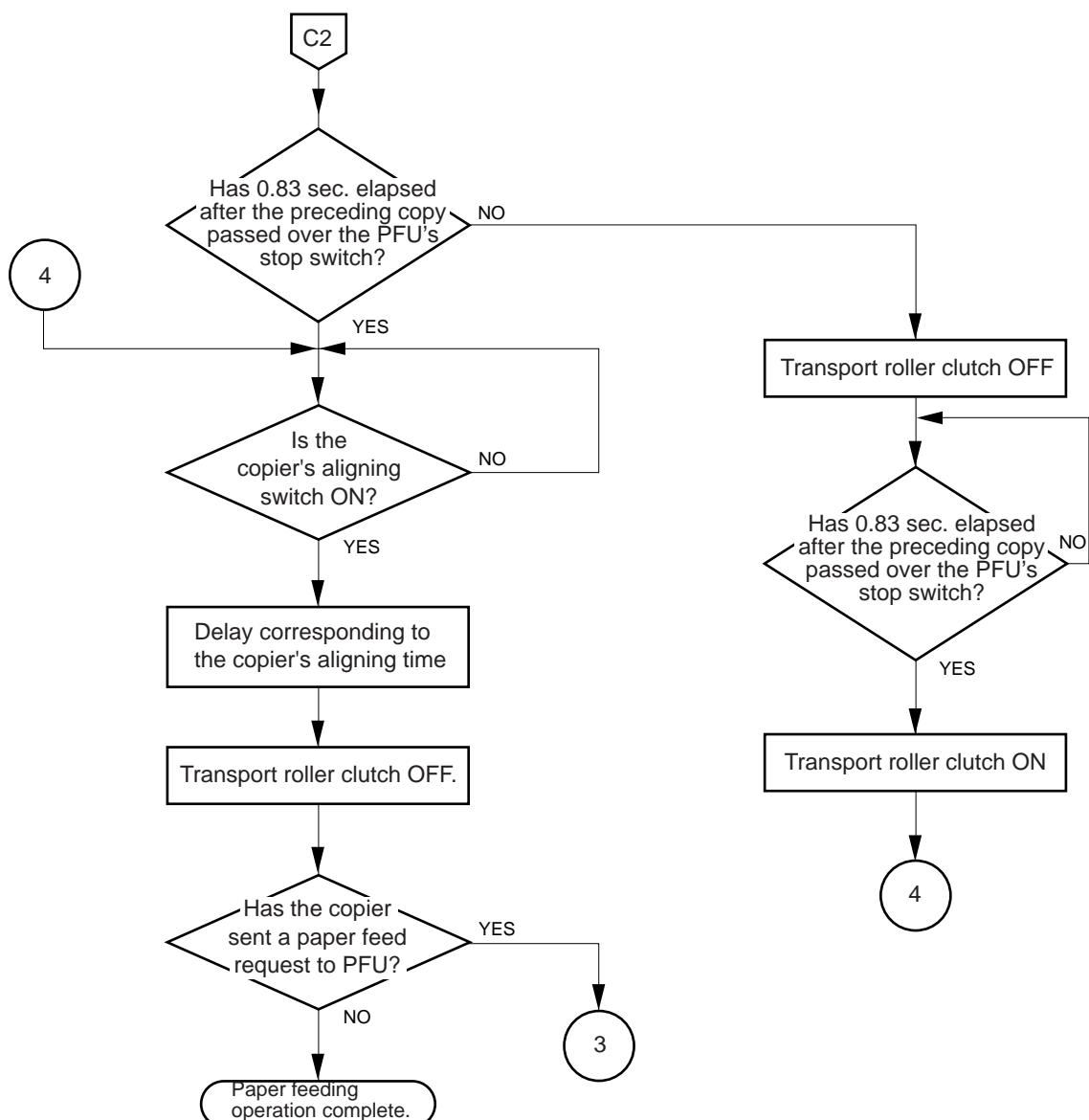


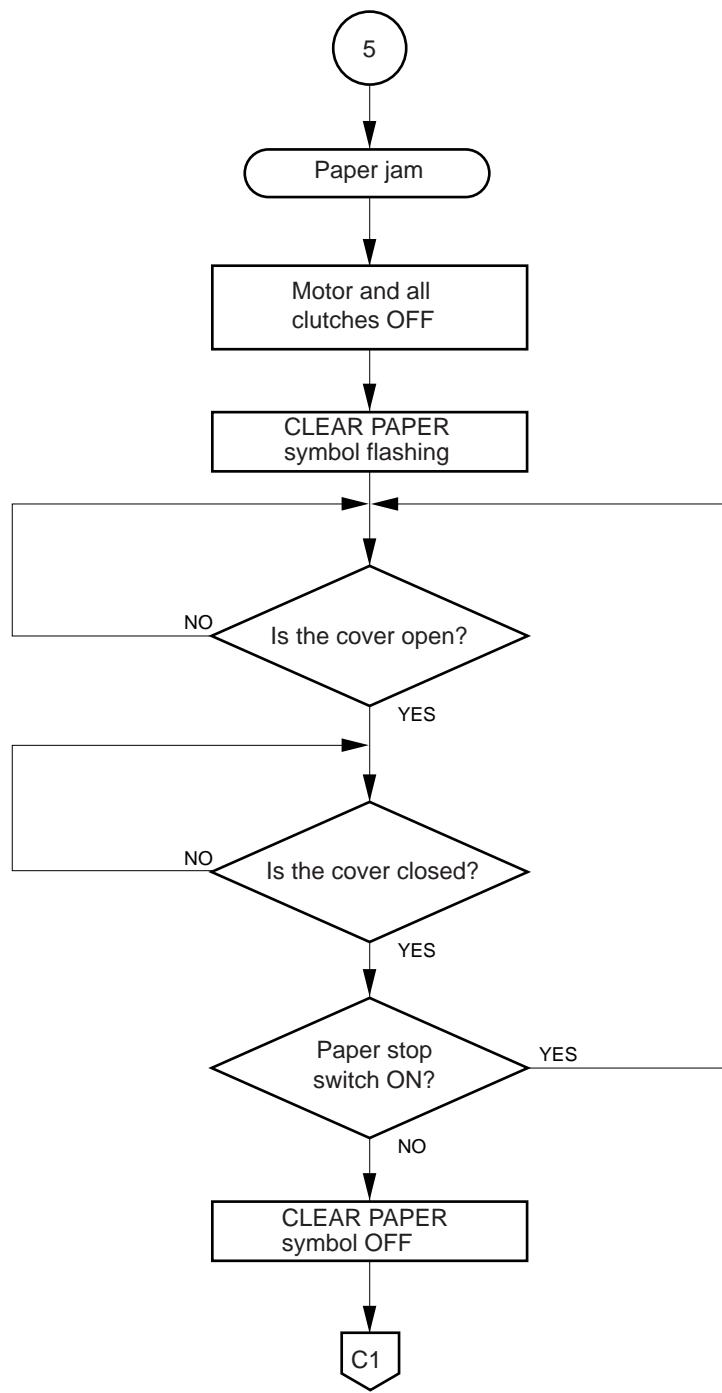
13.5 Flow Charts and Timing Charts

13.5.1 Flow chart



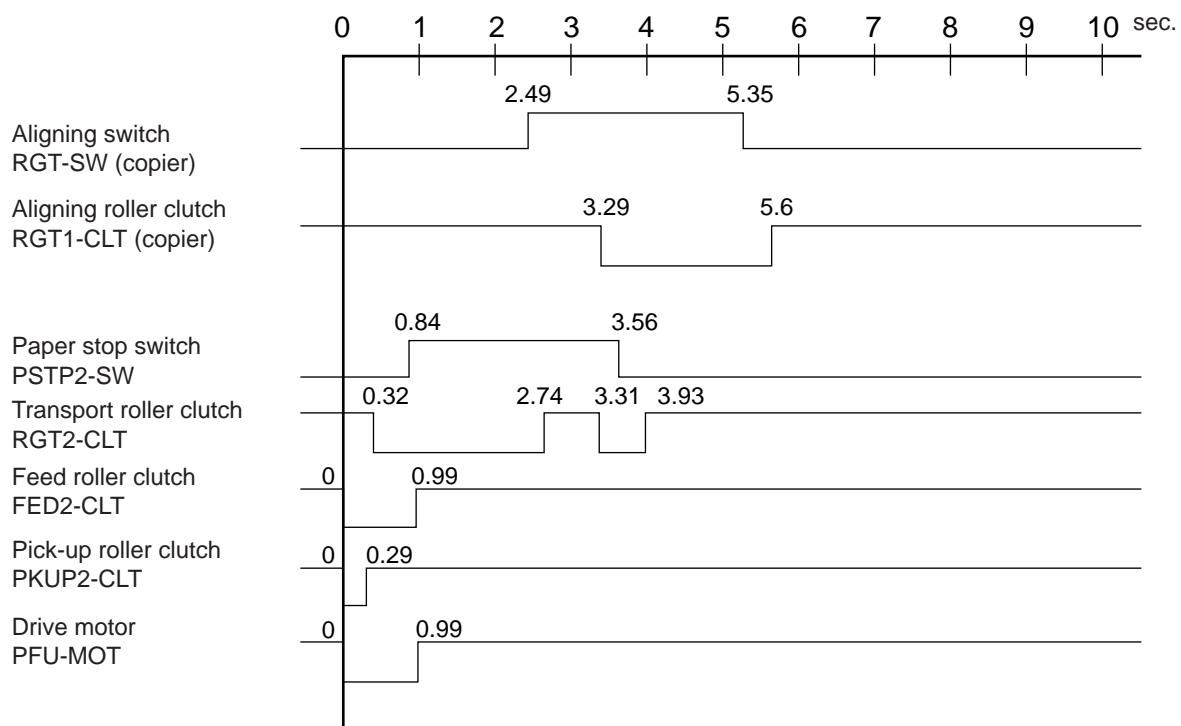




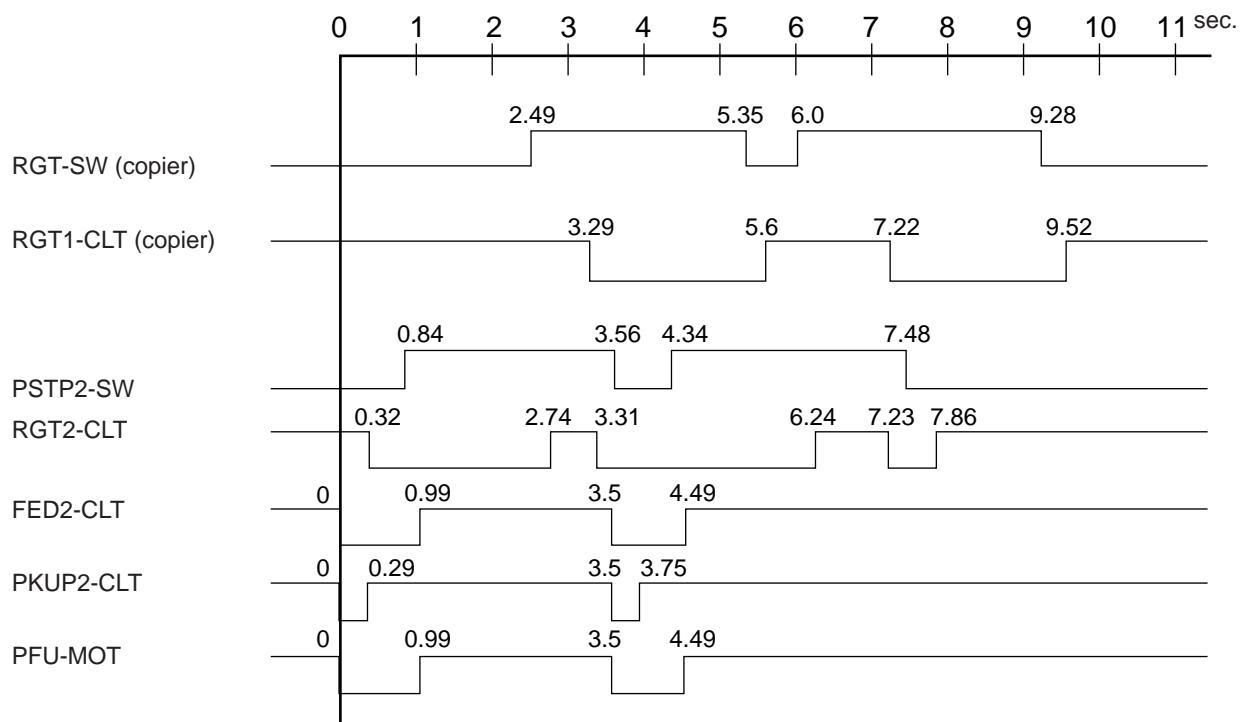


13.5.2 Timing chart

A4 lateral single-sheet copying (PFU)



A4 lateral two-sheets copying (PFU)



13.6 Explanation of Circuits

13.6.1 Interface signals

[A] Signals from the copier to the paper feeding unit (PFU):

(1) RGT-CLT2

Drives the transport roller clutch.

When the signal is "L", the clutch (RGT2-CLT) energizes.

(2) PKUP-CLT2

Drives the pick-up clutch.

When the signal is "L", the pick-up roller clutch (PKUP2-CLT) energizes.

(3) FED-CLT2

Drives the paper feed roller.

When the signal is "L", the clutch (FED2-CLT) energizes, causing the paper feed roller to start rotating.

(4) MOT-ON2

Rotates the drive motor.

When the signal is "L", the drive motor (PFU-MOT) starts rotating.

[B] Signals from the paper feeding unit (PFU) to the copier:

(1) CST2 (installation)

Tells the copier that PFU is installed. The signal becomes "L" with PFU installed.

(2) DR-SW2 (door switch)

Indicates whether or not the PFU's side cover is open. When the cover is closed, the door switch is turned on, causing the signal to become "L".

(3) FED-SW2 (paper stop switch)

Indicates the status of the PFU's paper stop switch. When there is paper on the paper stop switch, it is turned on, causing the signal to become "H".

(4) EMP-SW2 (paper empty switch)

Indicates whether or not there is paper in the PFU's cassette. When there is paper, the paper empty switch is turned on, causing the signal to become "L".

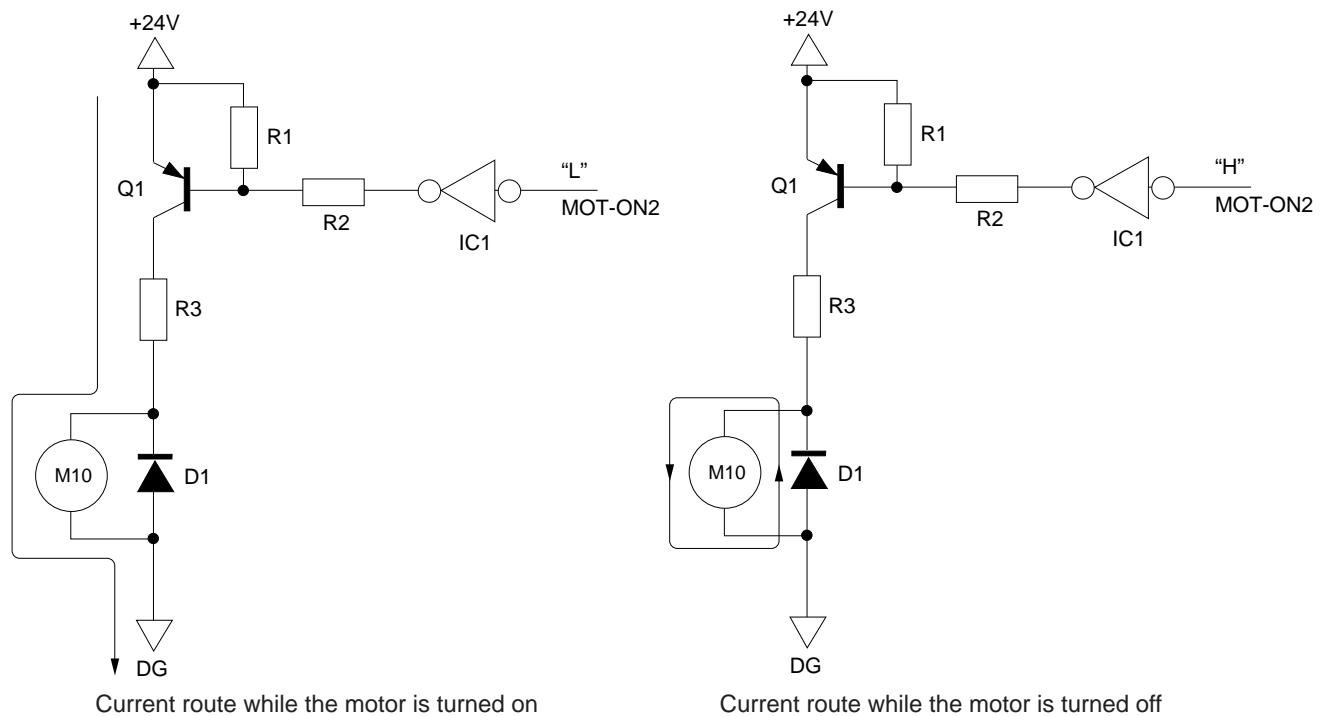
(5) SIZ13 - 10 (Paper size switches)

Indicate the size of the cassette. When the size mark plate pushes the switches, the corresponding paper size signal becomes "L".

13.6.2 Driving of the drive motor

The drive motor M10 (PFU-MOT) is driven by transistor Q1 as described below:

When the signal MOT-ON2*1 from the copier becomes "L", an "L" voltage is applied to the base of Q1, Q1 is turned on, causing current to flow from +24V→Q1's emitter→Q1's collector→R3→DG. This will cause the drive motor (M10) (PFU-MOT) to rotate. When the MOT-ON2 signal becomes "H", Q1 is turned off, shutting off the above current route. But while the motor continues to rotate due to its inertia, current also tries to continue to flow, causing a voltage to be generated between the input and output terminals of the motor. Since this voltage is applied between the anode and cathode of D1, the inverse electromotive voltage occurring in the motor is short-circuited and restricted.

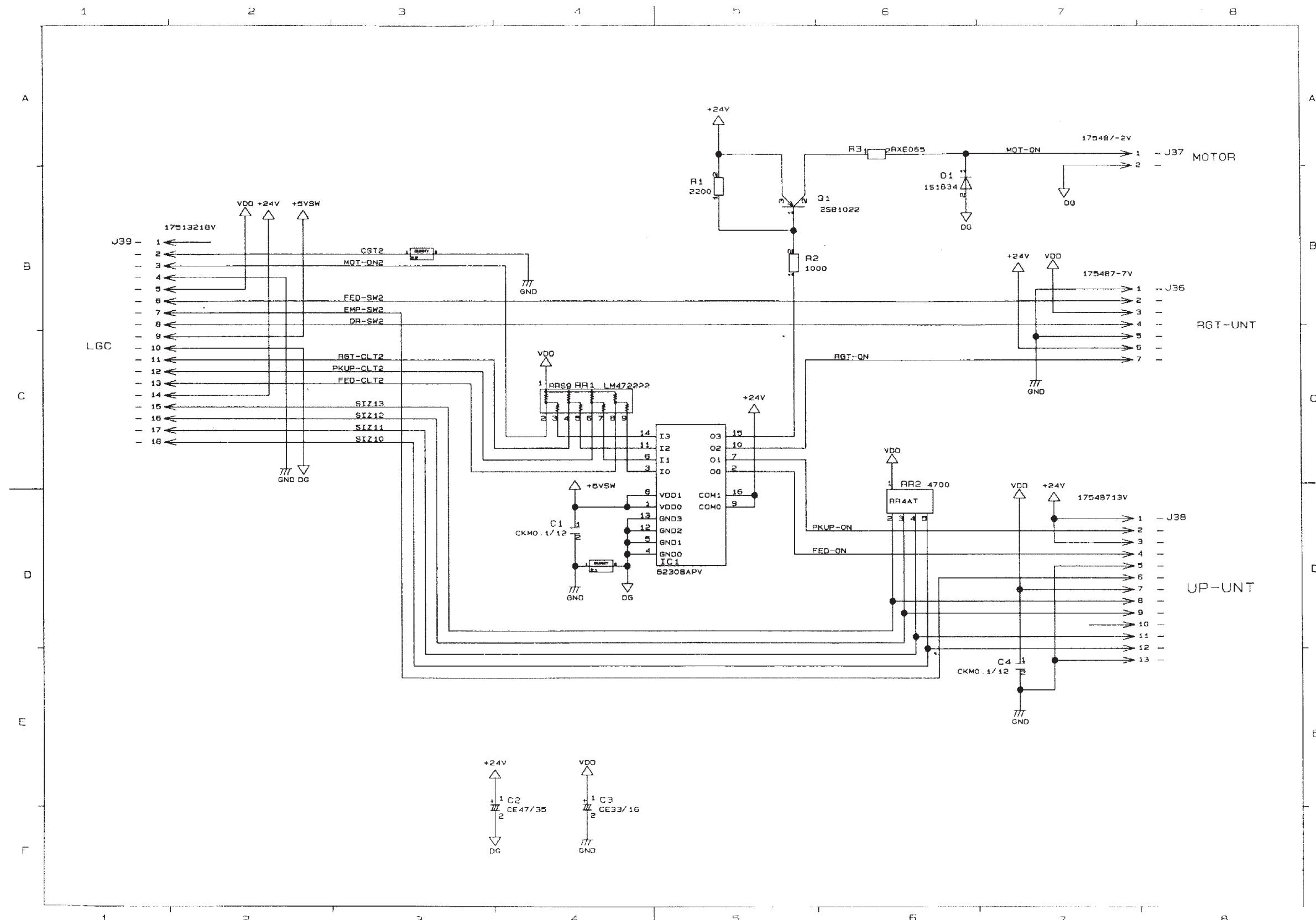


*1: The MOT-ON2 signal is to cause the motor (PFU-MOT) M10 to rotate and is supplied by the copier.

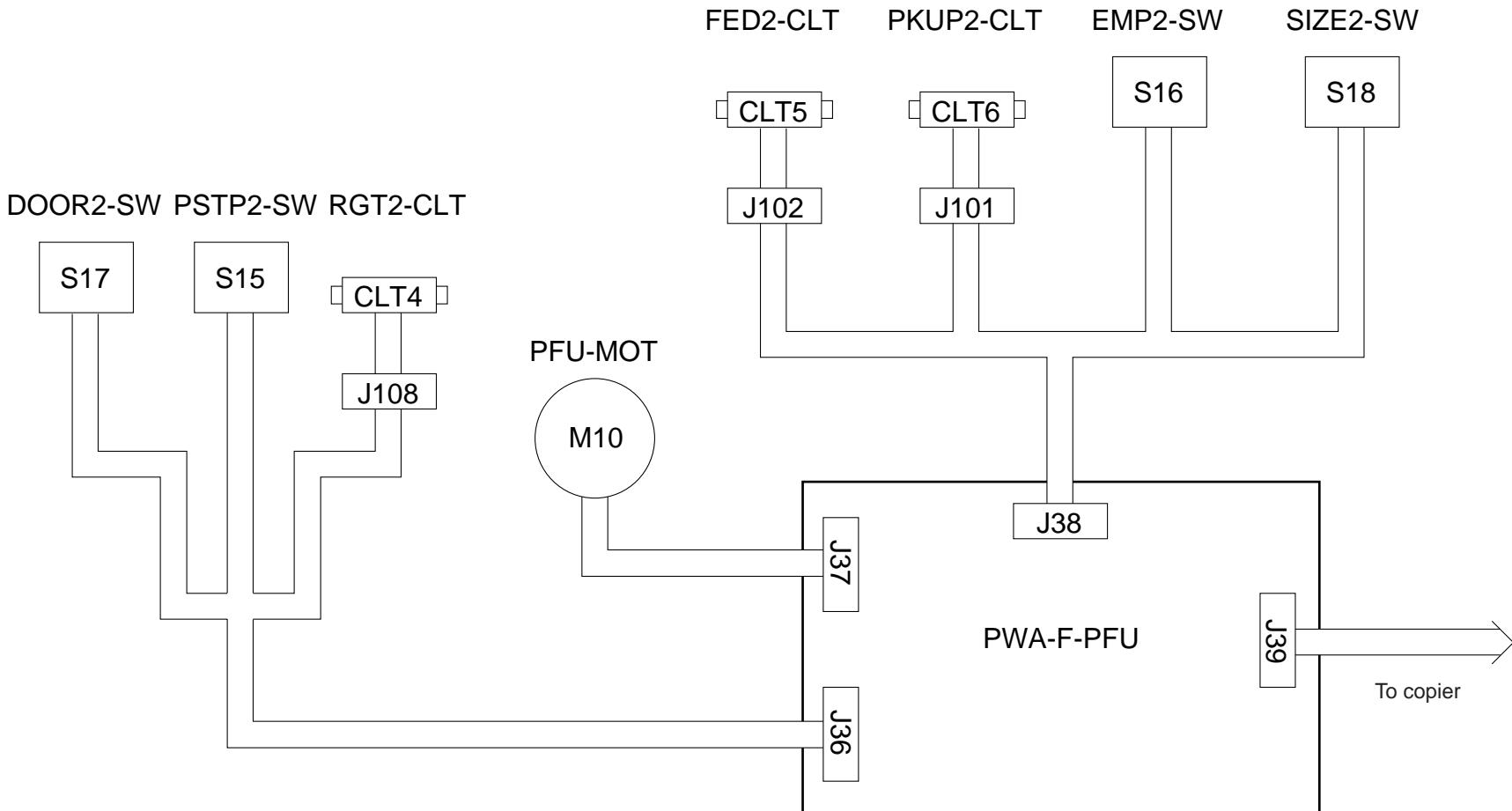
When this signal becomes "L", the motor starts rotating.

13.7 Electric Circuit Diagram and PC Board Assembly

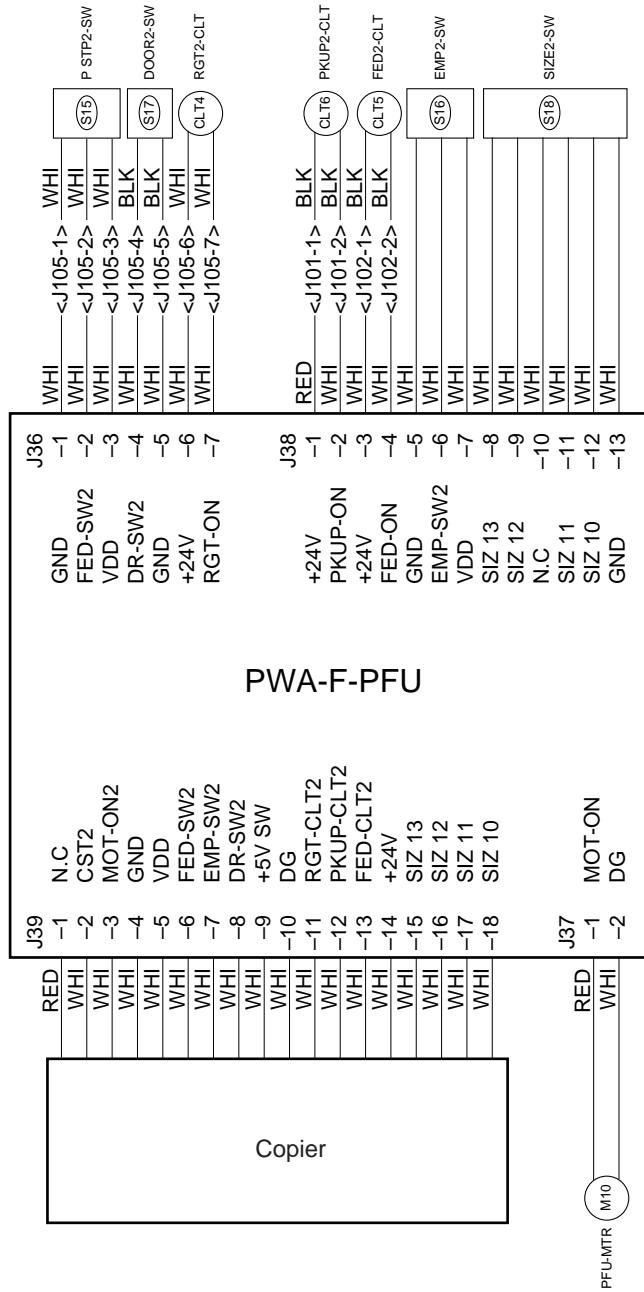
13.7.1 PFU drive circuit diagram



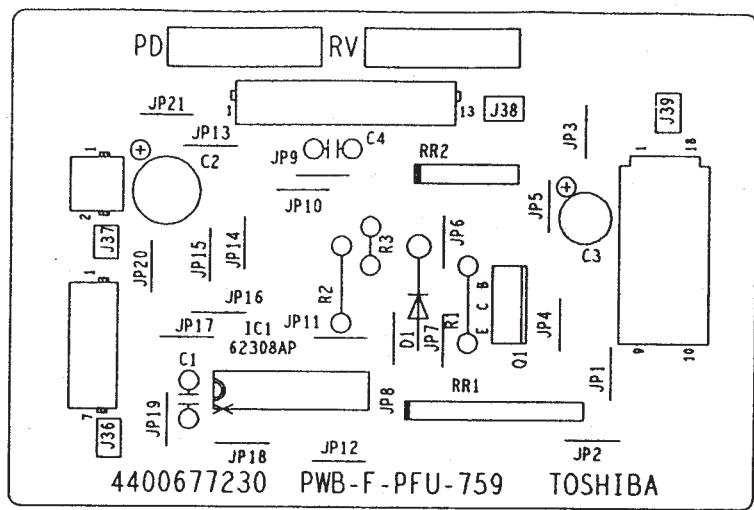
13.7.2 Harness location diagram



13.7.3 Harness connection diagram



13.7.4 PC board assembly (PWA-F-PFU)



14. ELECTRIC CIRCUIT DIAGRAM

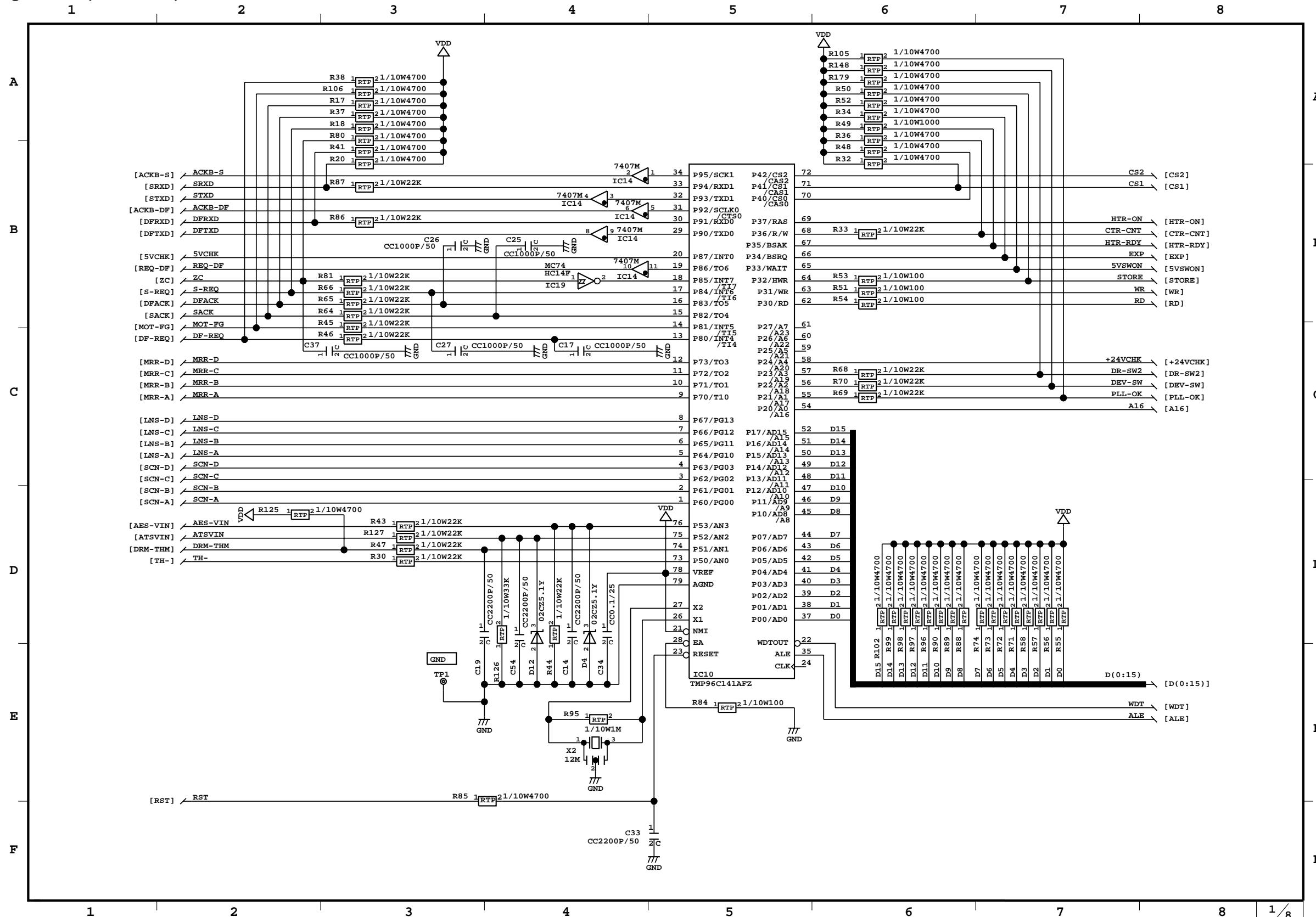


HINT

How to search for where a signal in circuit diagram has jumped to.

14.1 Logic Circuit

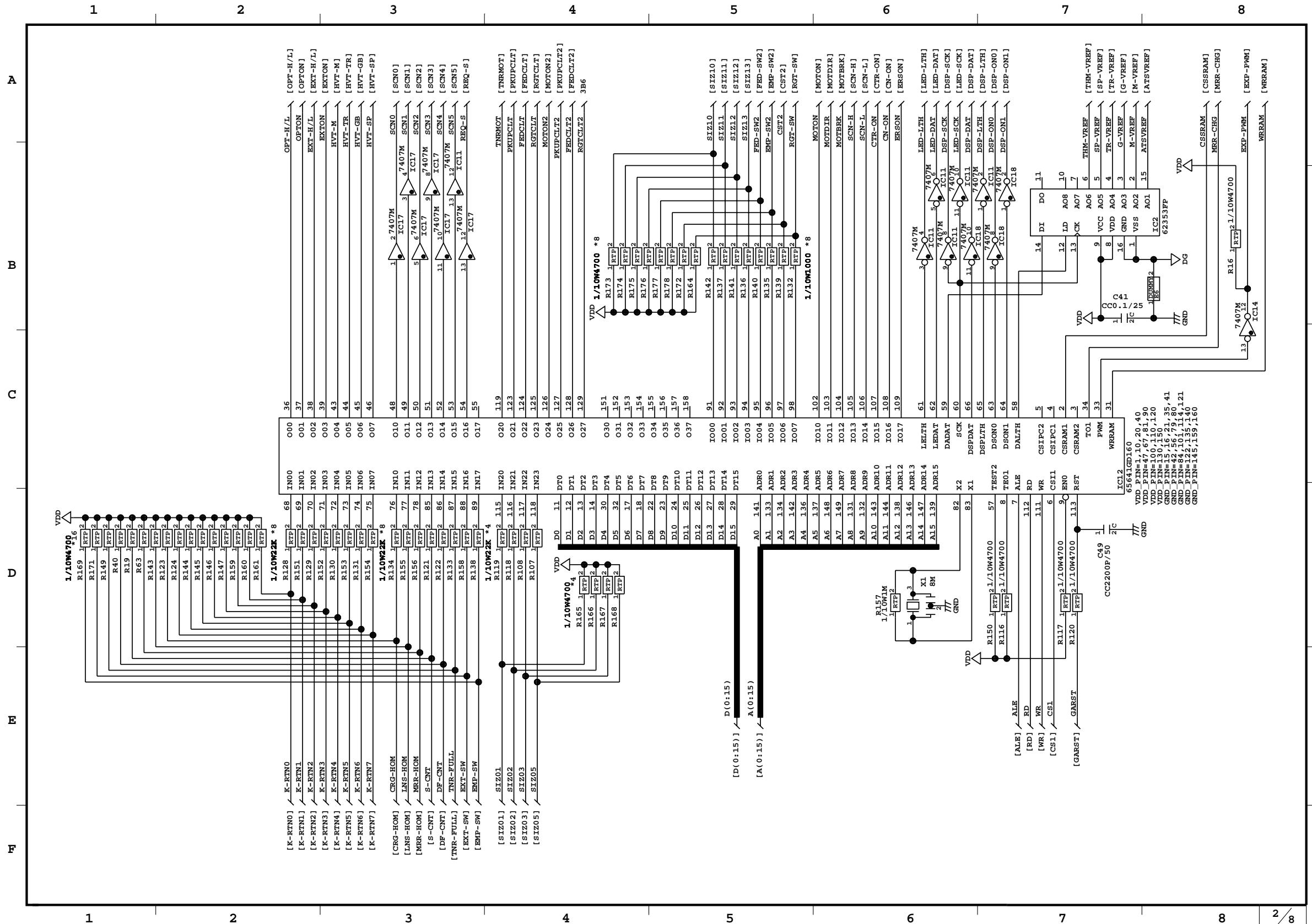
14.1.1 1550 Logic Circuit (PWA-F-LGC) 1/8





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How to search for where a signal in circuit diagram has jumped to.

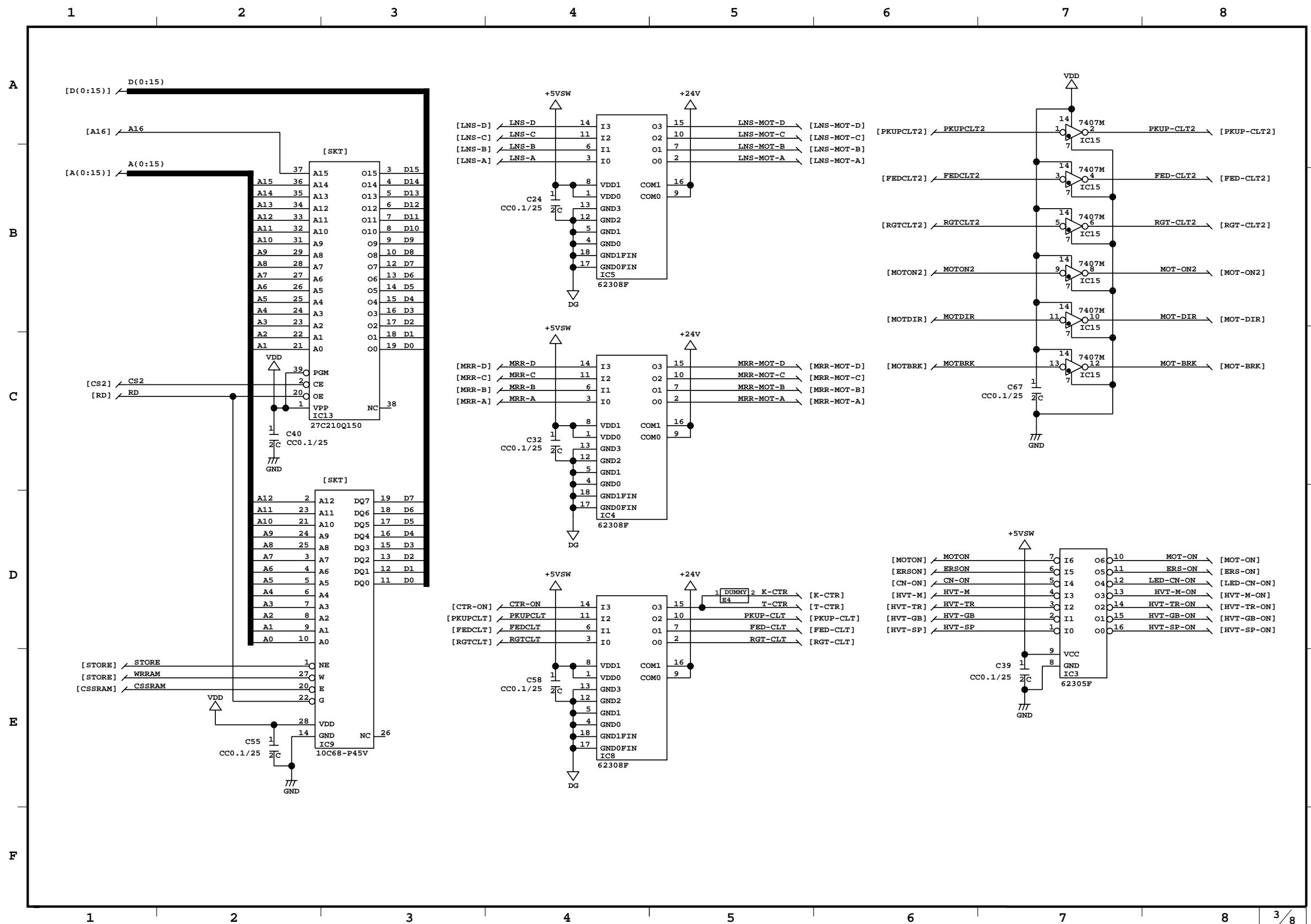


Logic Circuit (PWA-F-LGC) 3/8



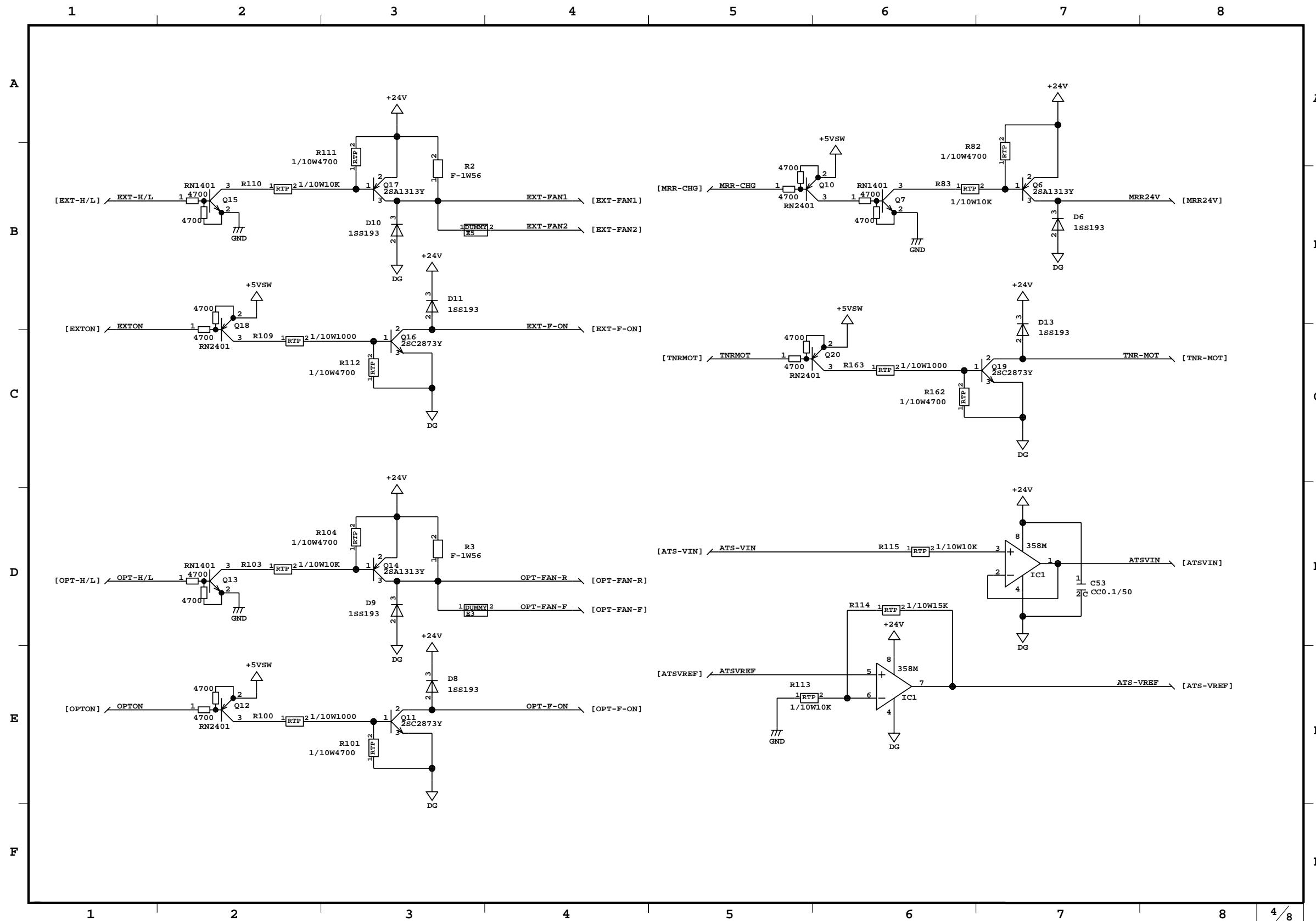
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How to search for where a signal in a circuit diagram has jumped to.





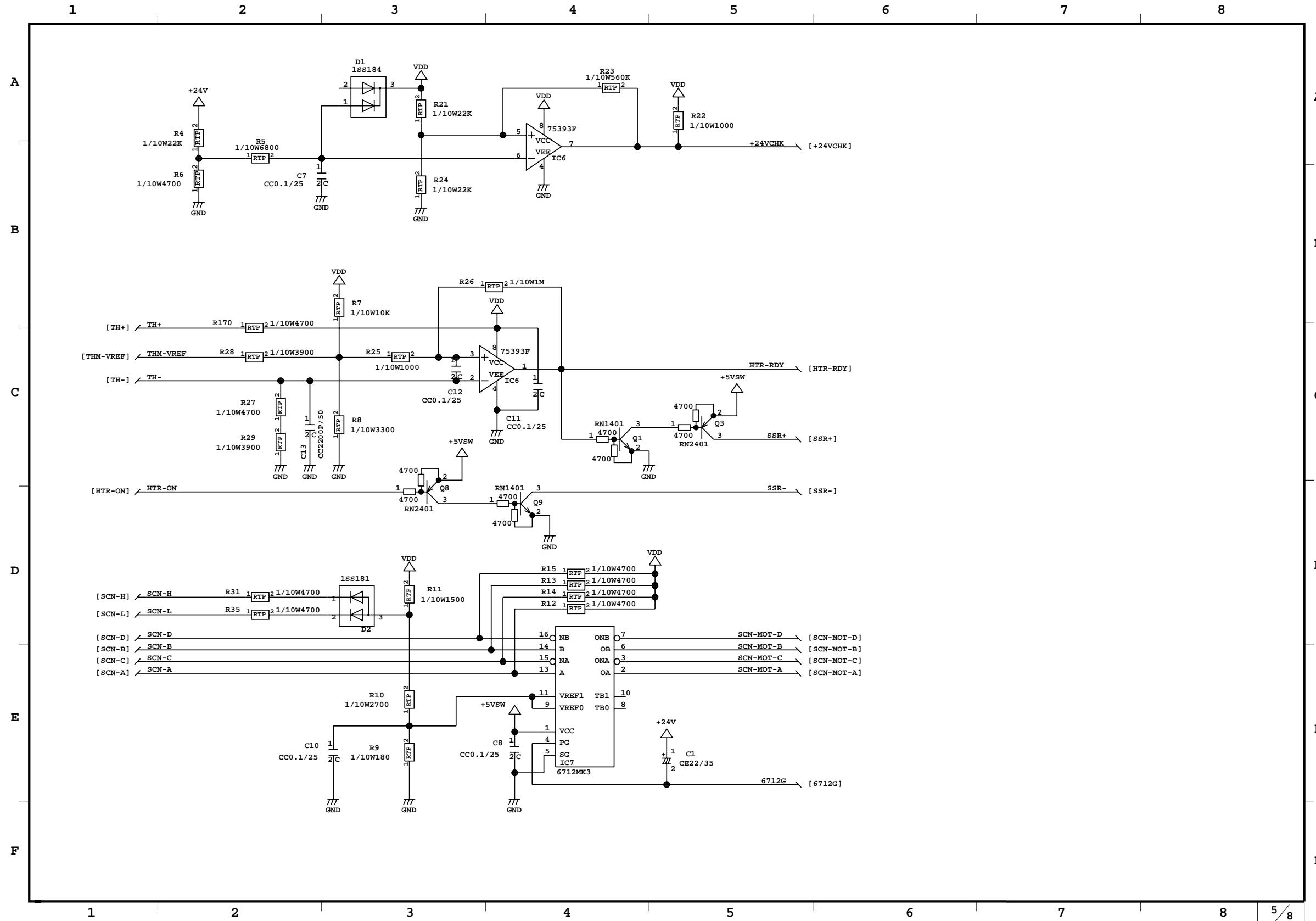
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How to search for where a signal in a circuit diagram has jumped to.



Logic Circuit (PWA-F-LGC) 5/8



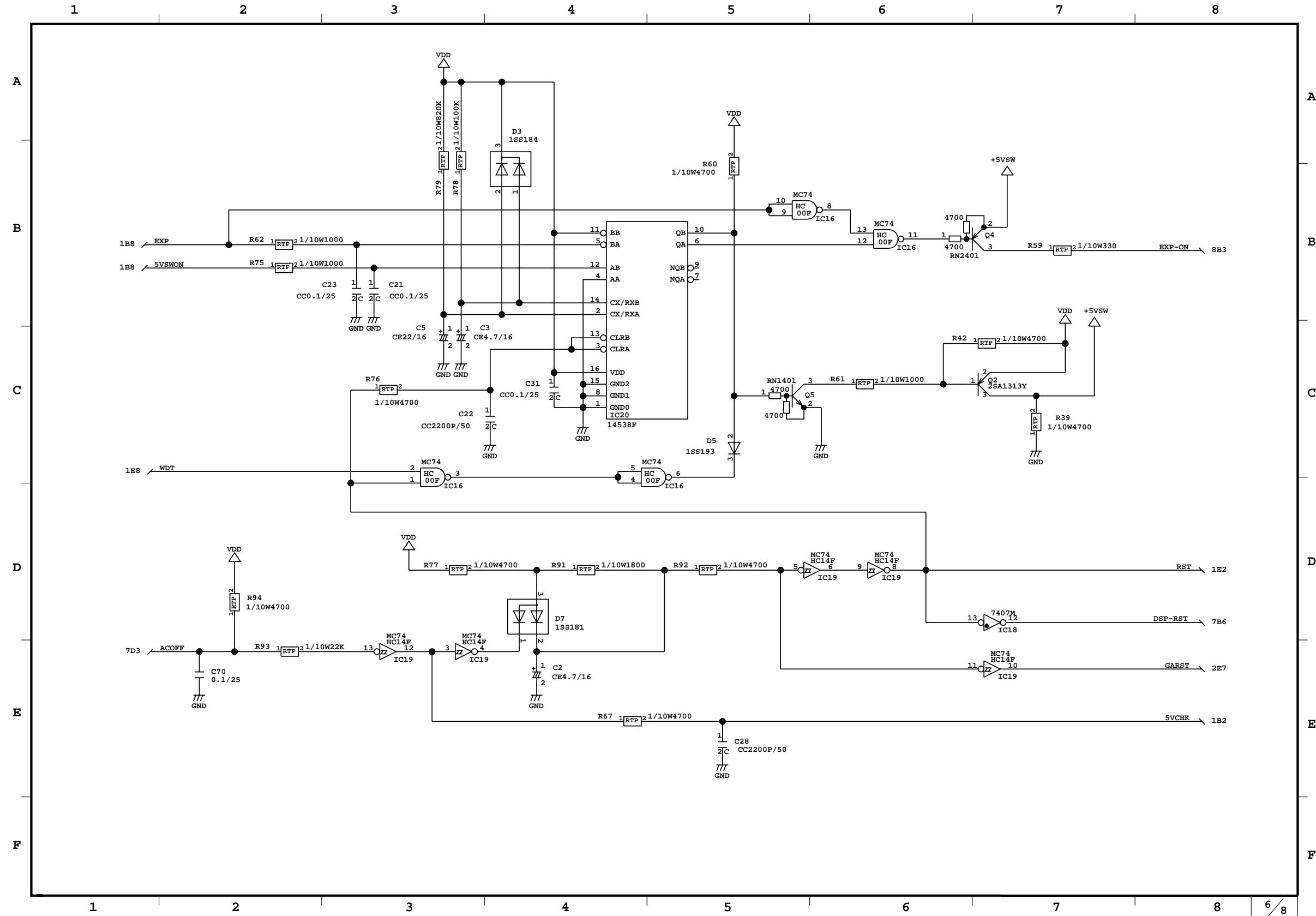
HINT
How to search for where a signal in a circuit diagram has jumped to.



Logic Circuit (PWA-F-LGC) 6/8



HINT

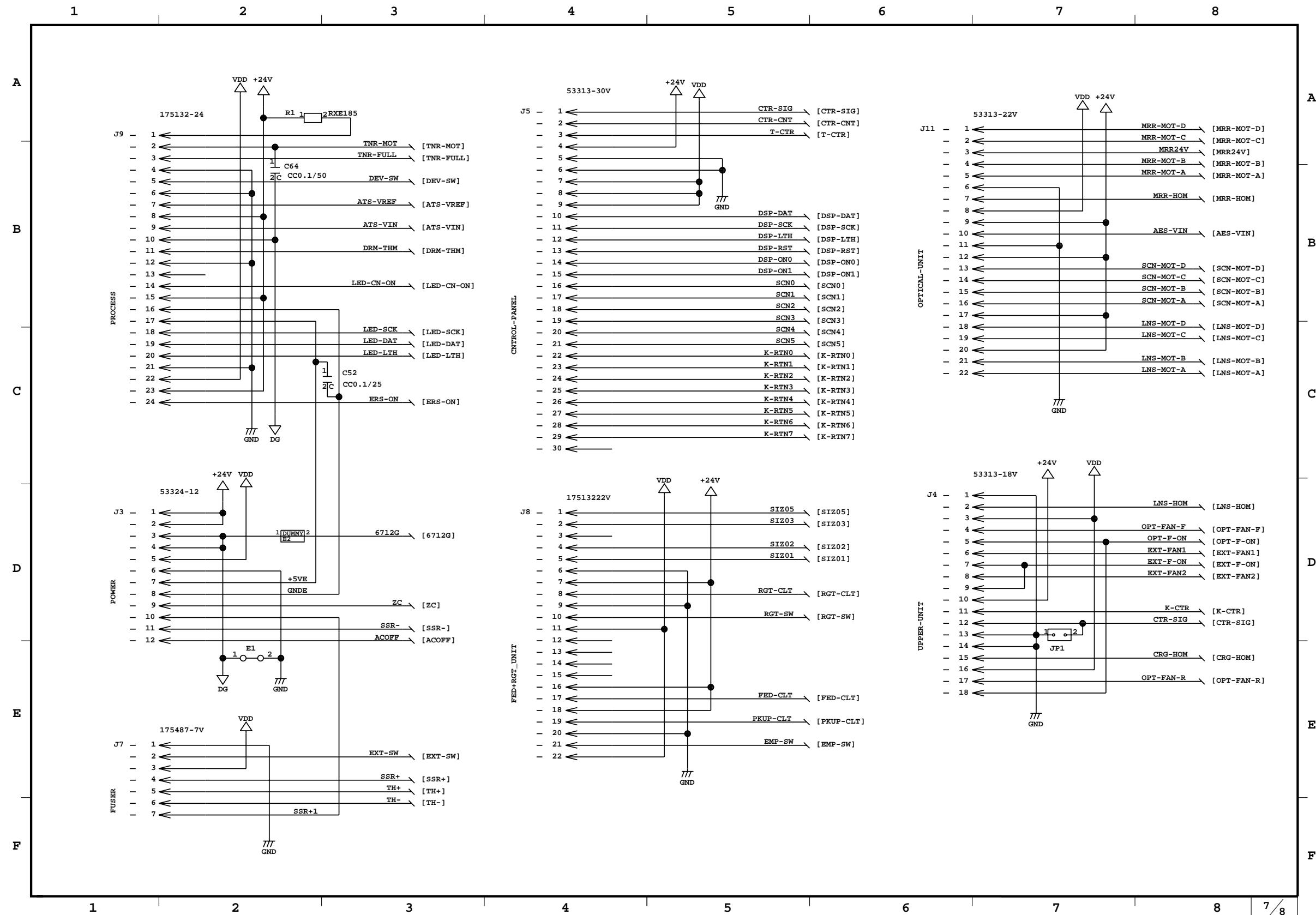


Logic Circuit (PWA-F-LGC) 7/8



HINT

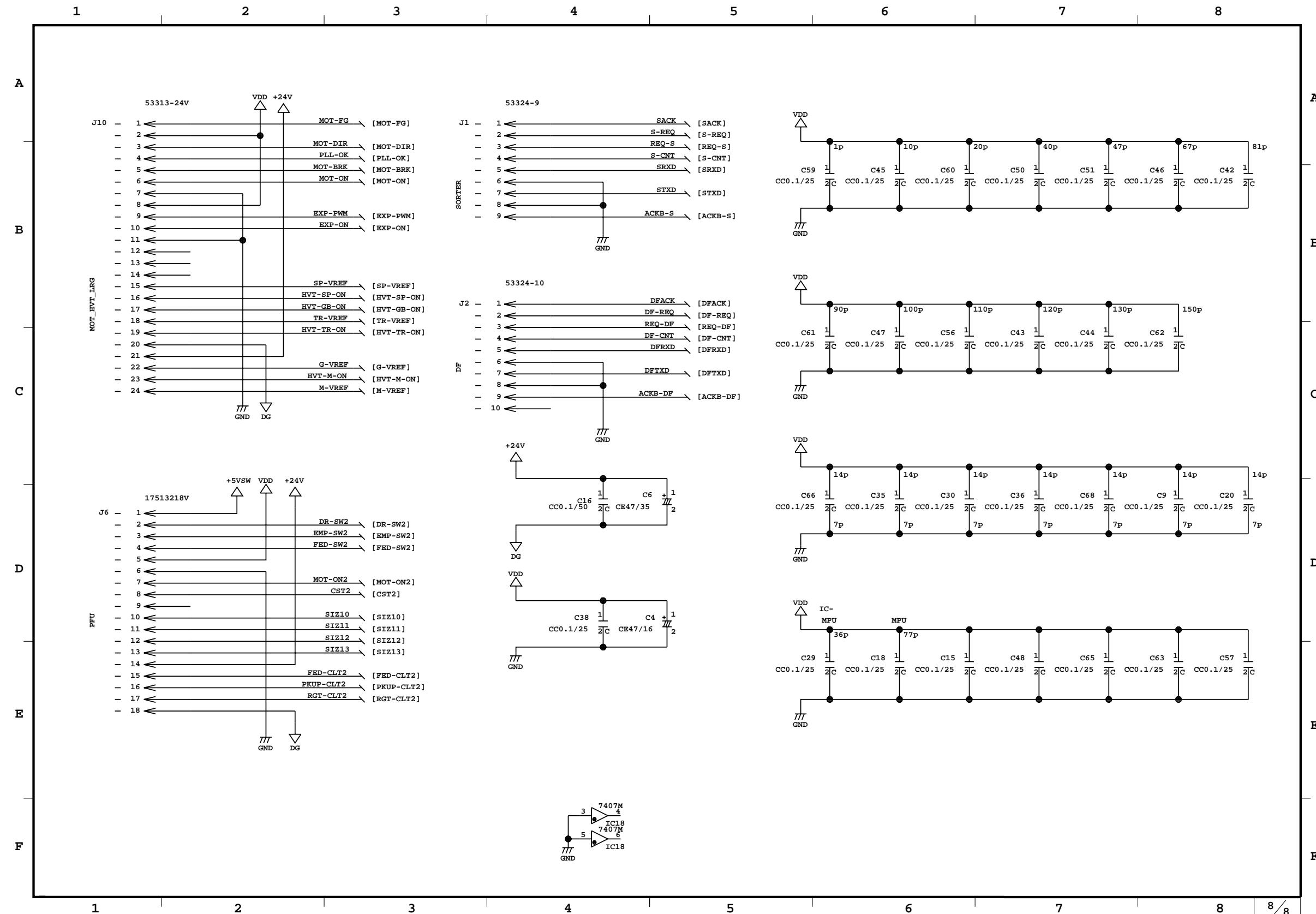
How to search for where a signal in a circuit diagram has jumped to.





HINT

How to search for where a signal in a circuit diagram has jumped to.

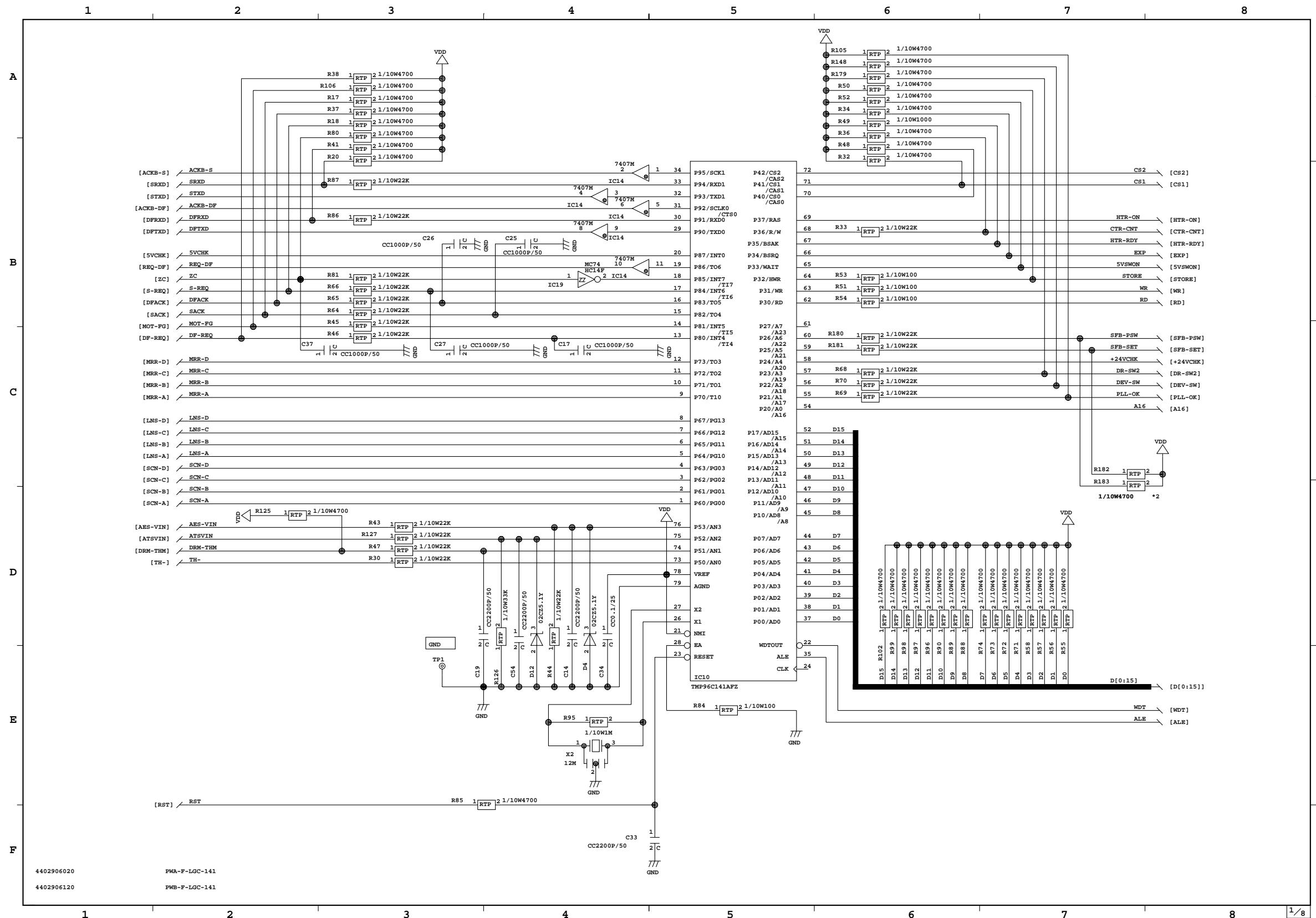


14.1.2 1560 Logic Circuit (PWA-F-LGC) 1/8



HINT

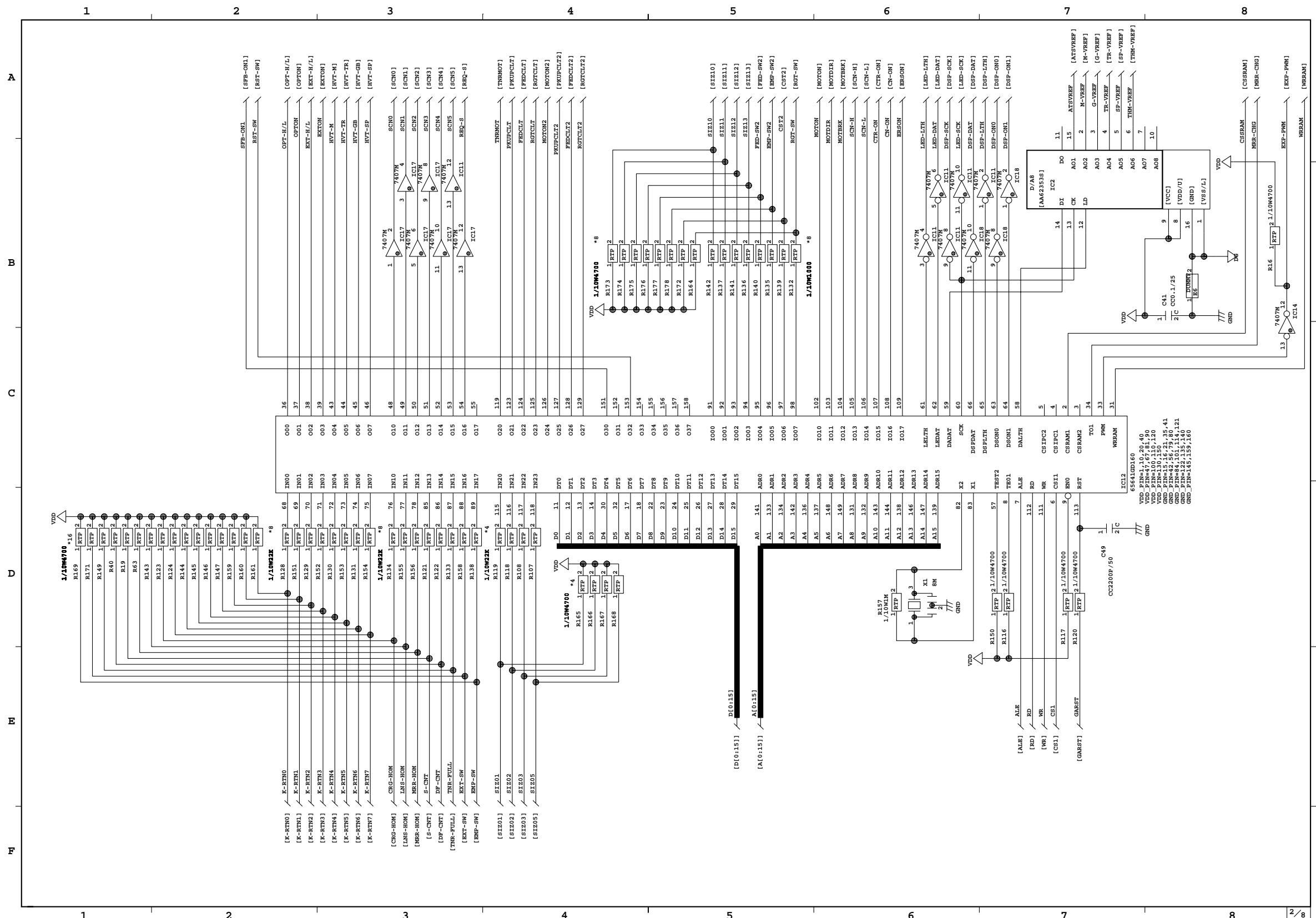
How to search for where a signal in a circuit diagram has jumped to.





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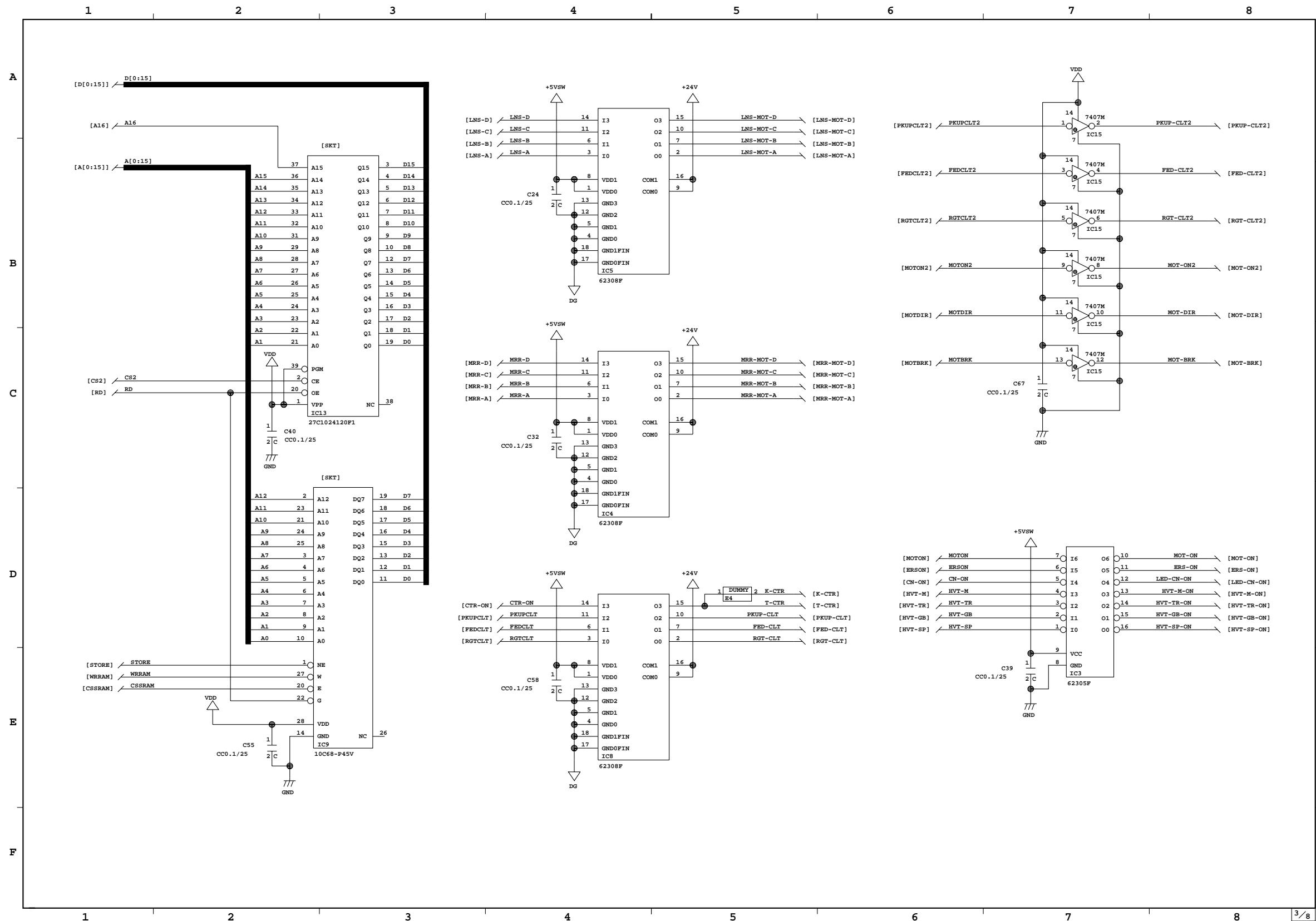
How to search for where a signal in a circuit diagram has jumped to.



1560 Logic Circuit (PWA-F-LGC) 3/8

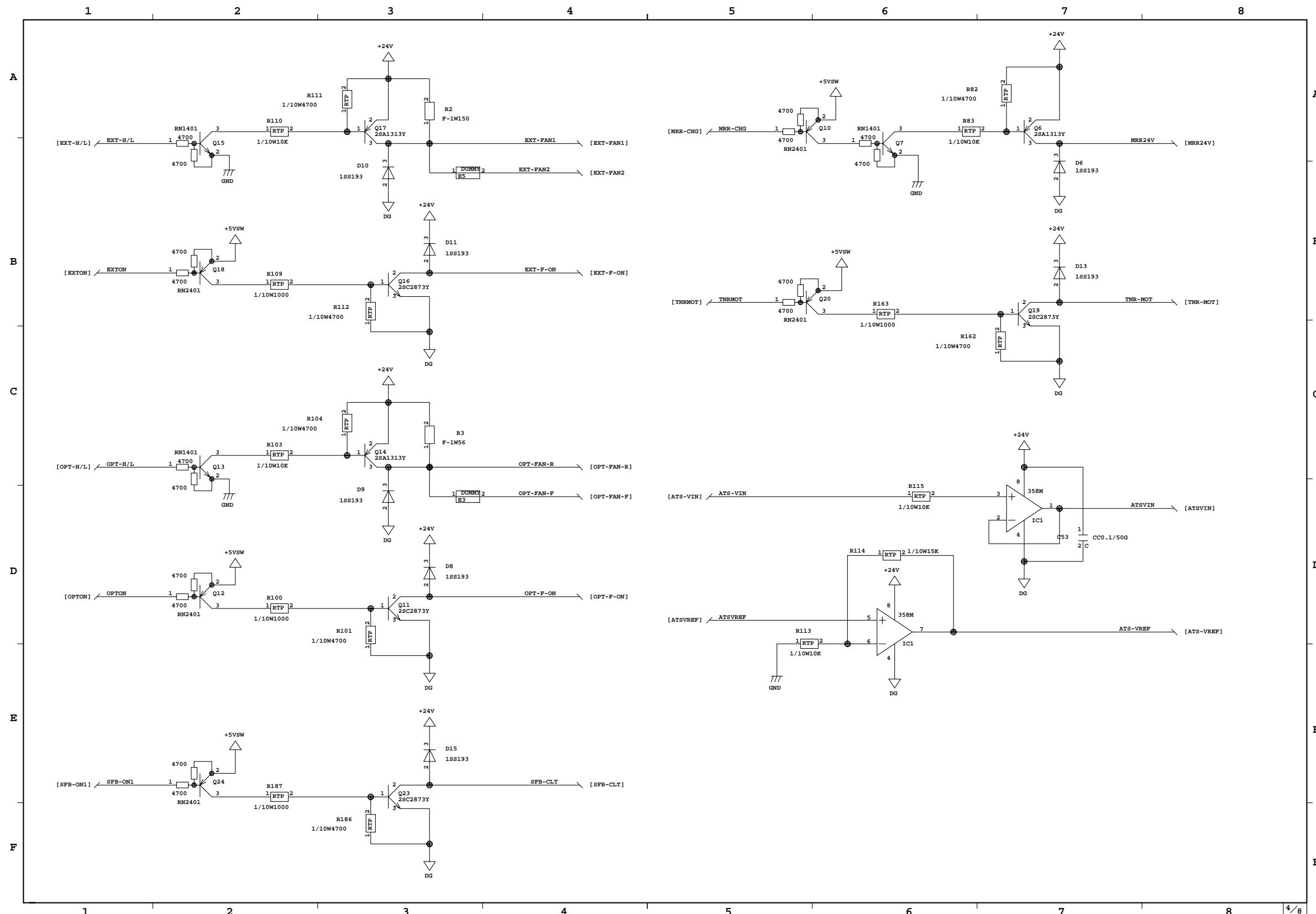


HINT
How to search for where a signal in a circuit diagram has jumped to.



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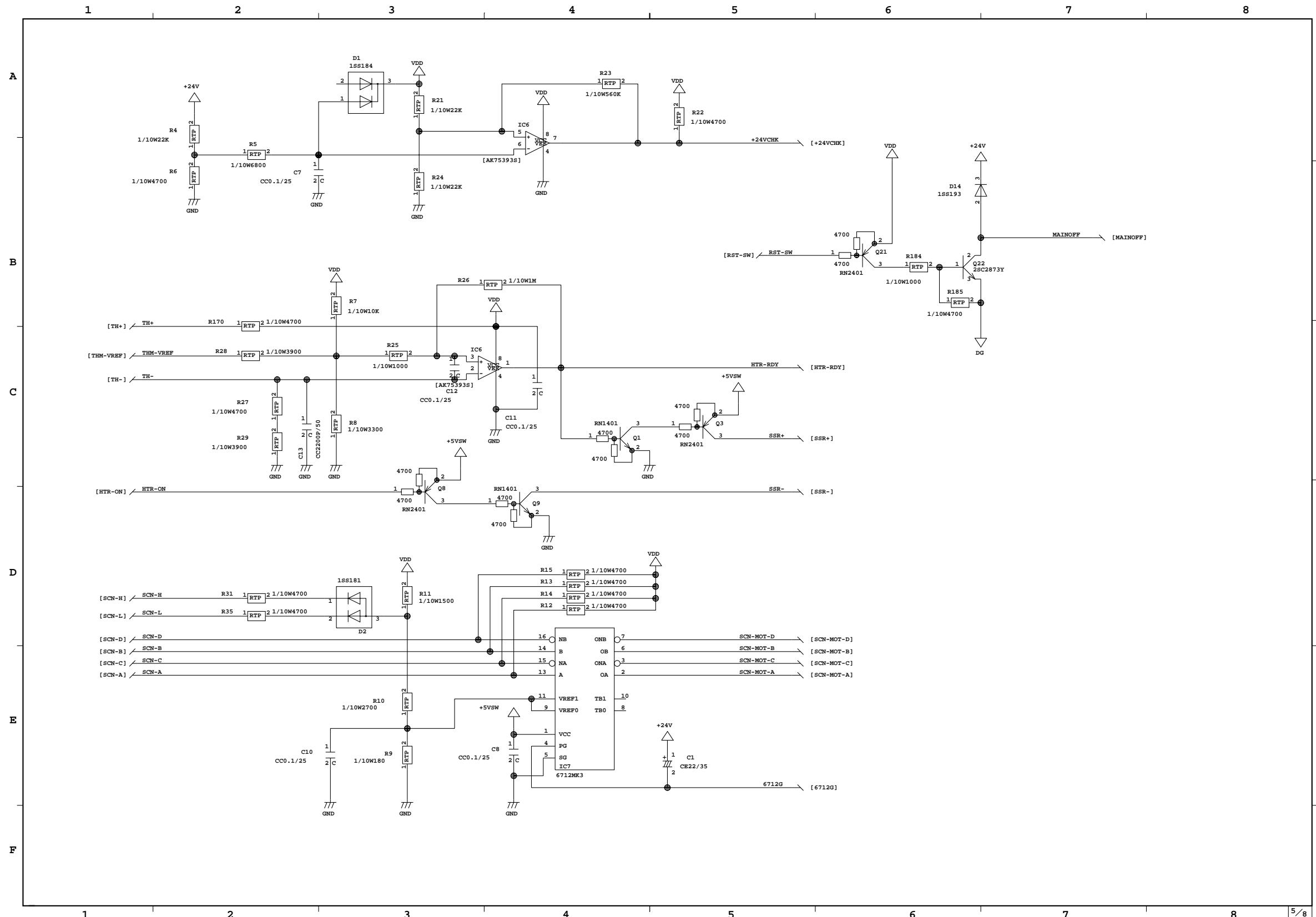
How to search for where a signal in a circuit diagram has jumped to.



1560 Logic Circuit (PWA-F-LGC) 5/8



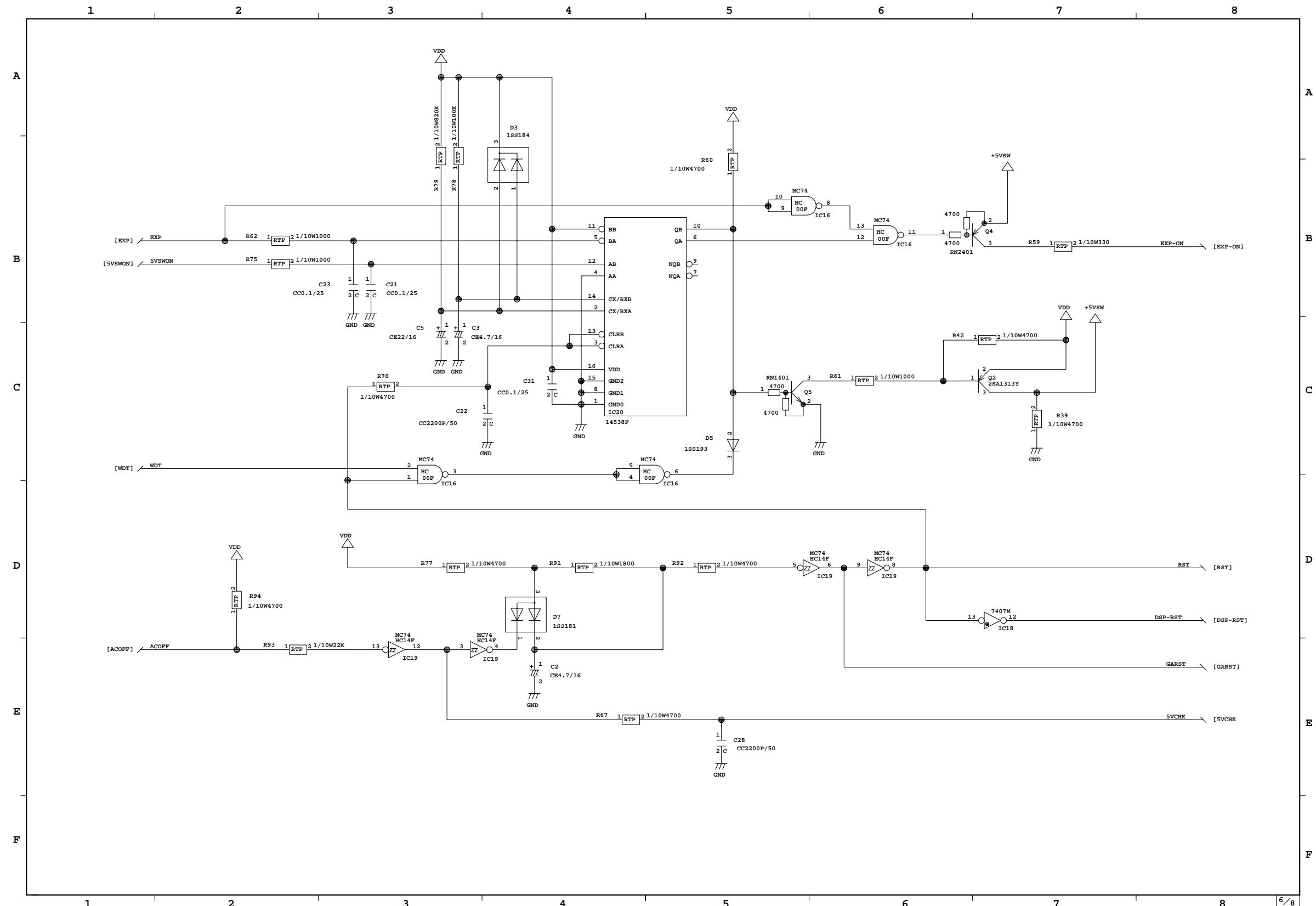
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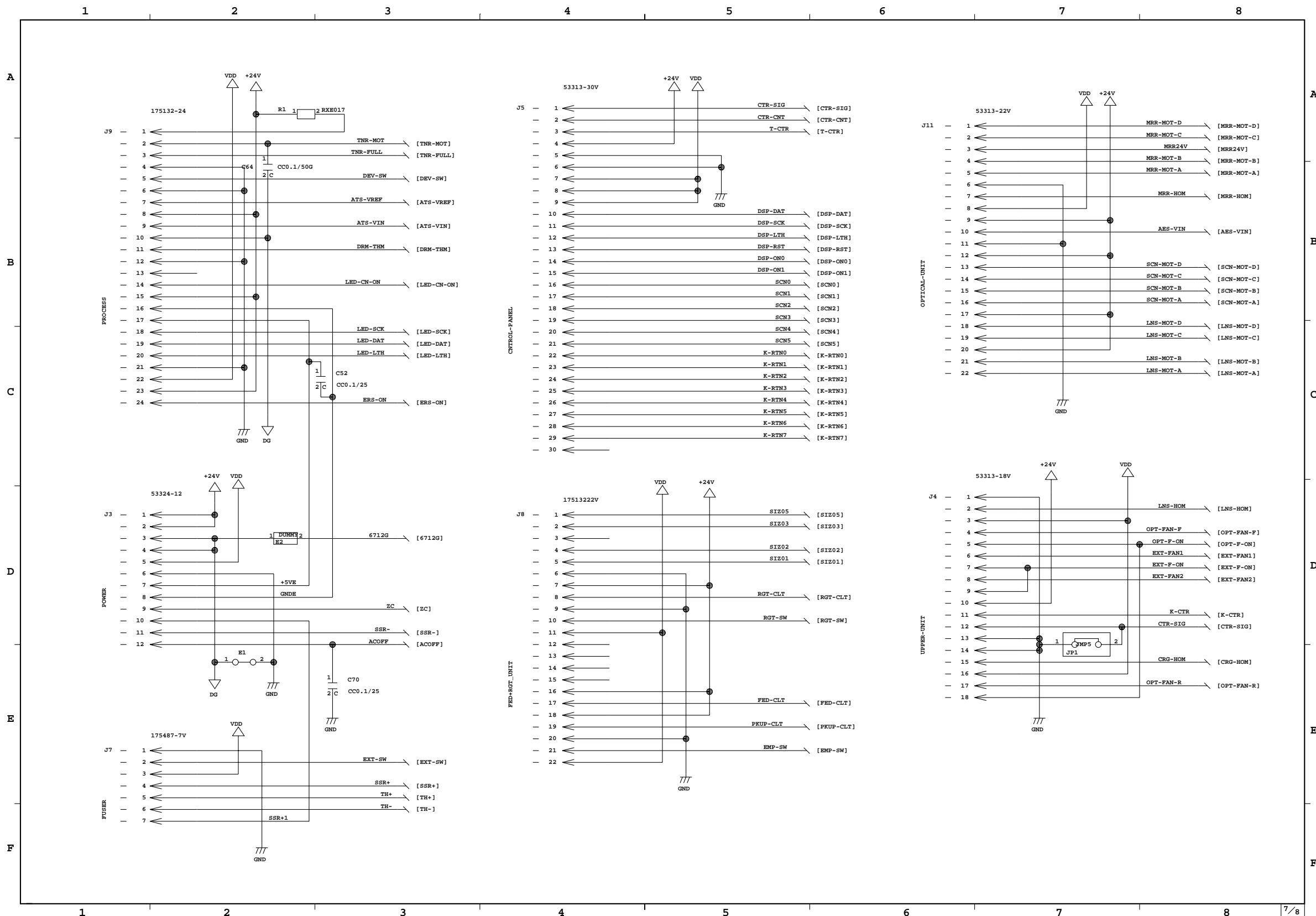
How to search for where a signal in a circuit diagram has jumped to.





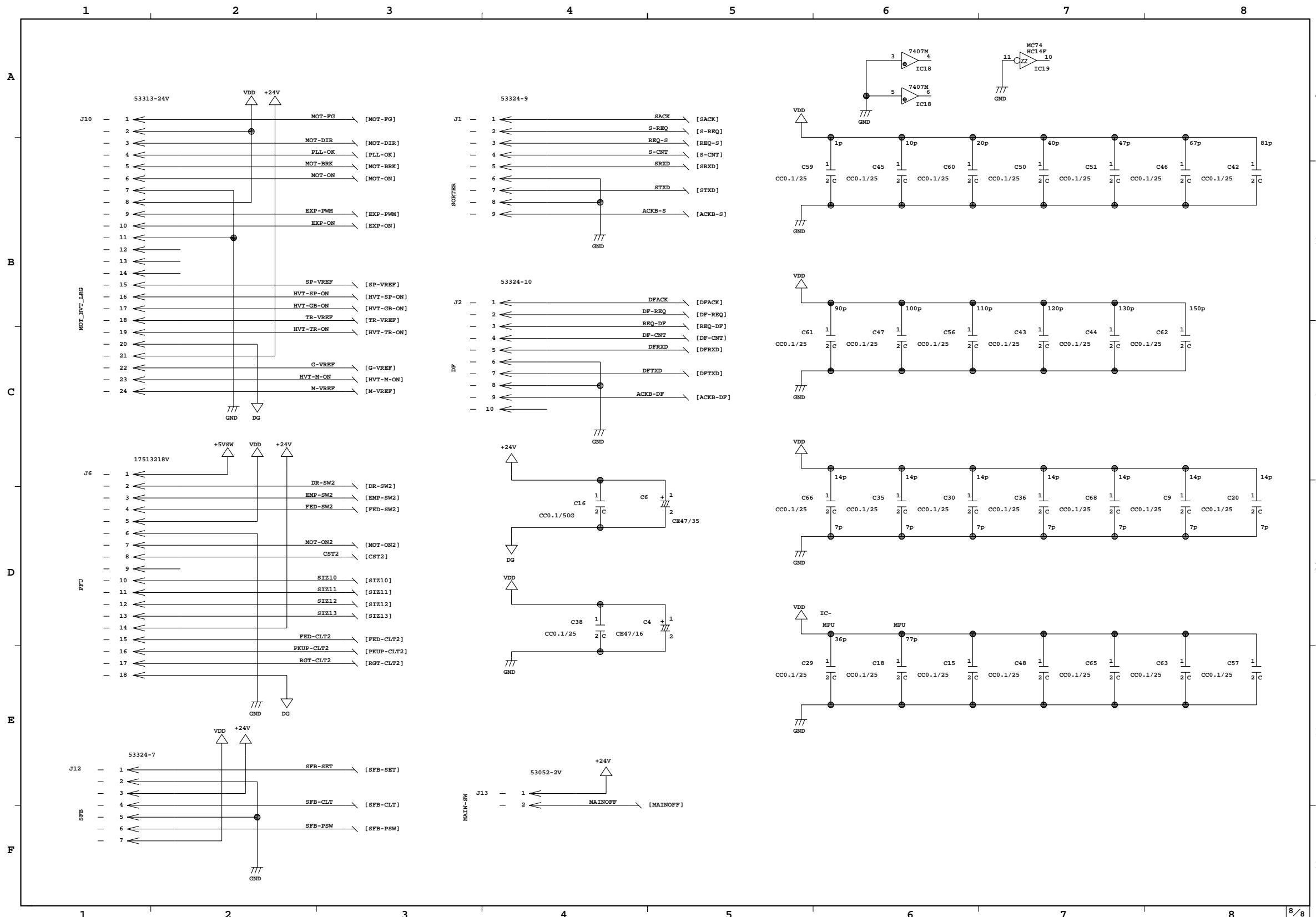
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How to search for where a signal in circuit diagram has jumped to.



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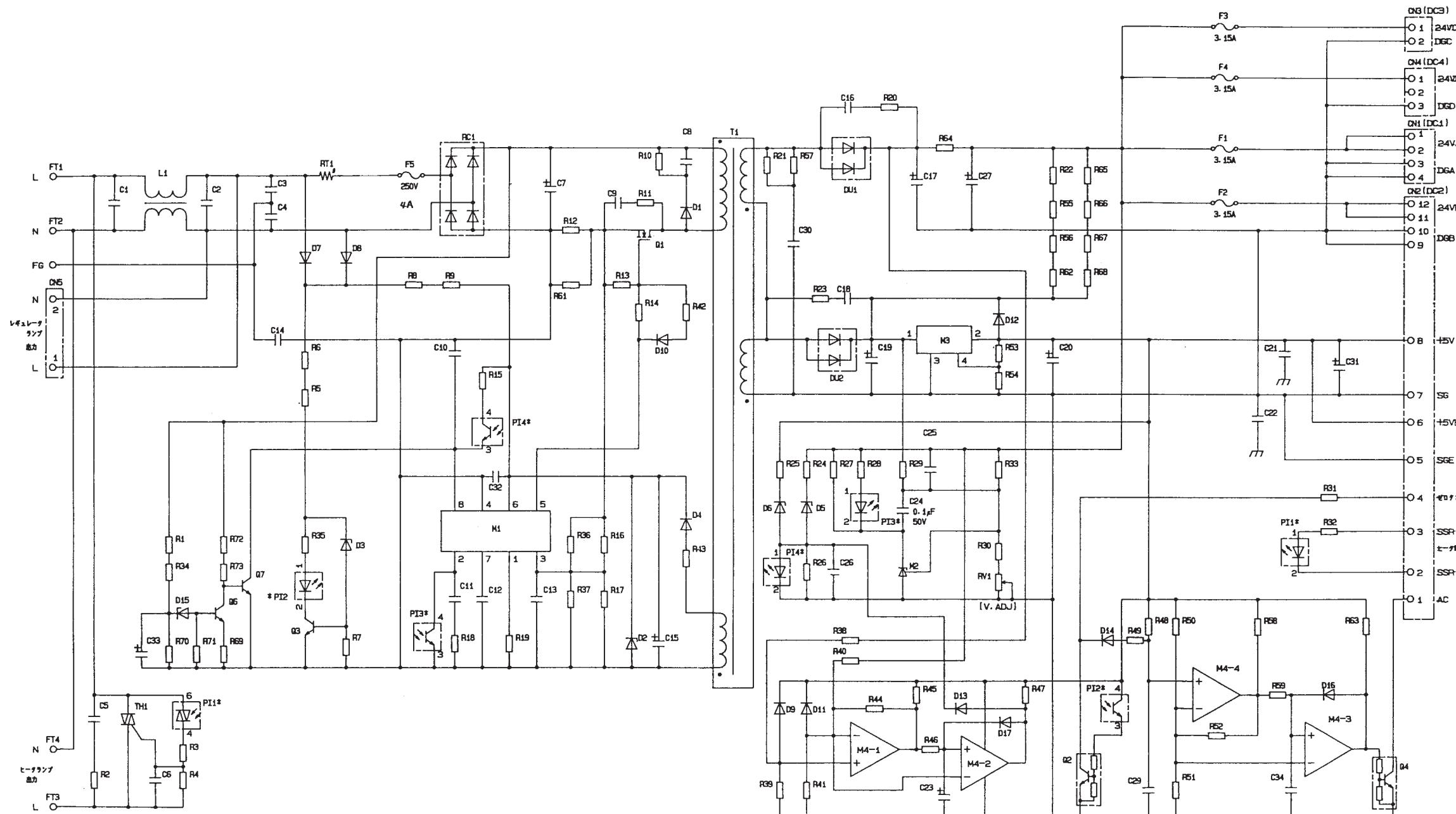
How to search for where a signal in a circuit diagram has jumped to.



14.2 Power Supply Circuit (PWA-F-PWR)



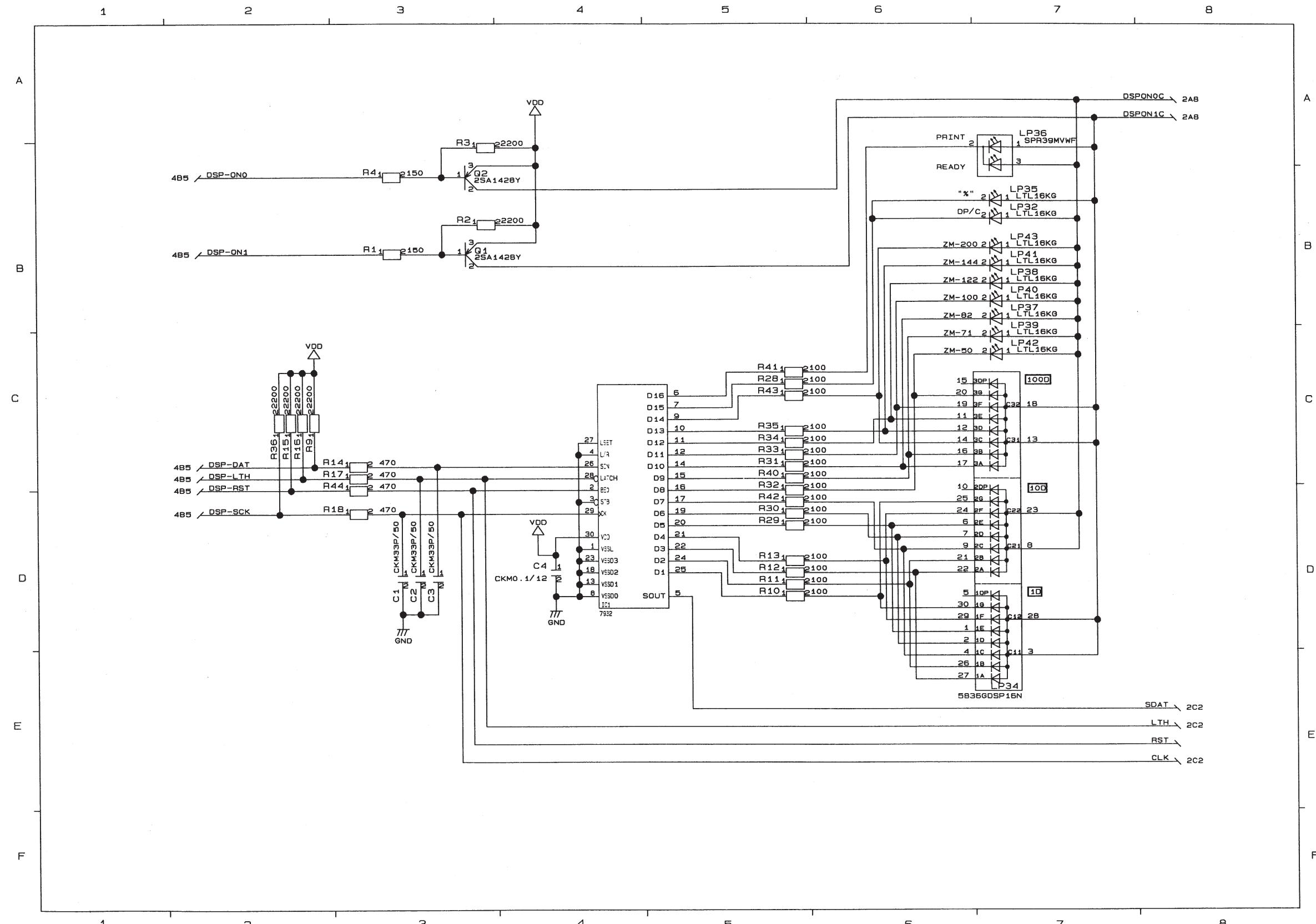
HINT
How to search for where a signal in a circuit diagram has jumped to.



14.3 Control Panel Circuit (PWA-F-PNL) 1/4



HINT
How to search for where a signal in a circuit diagram has jumped to.

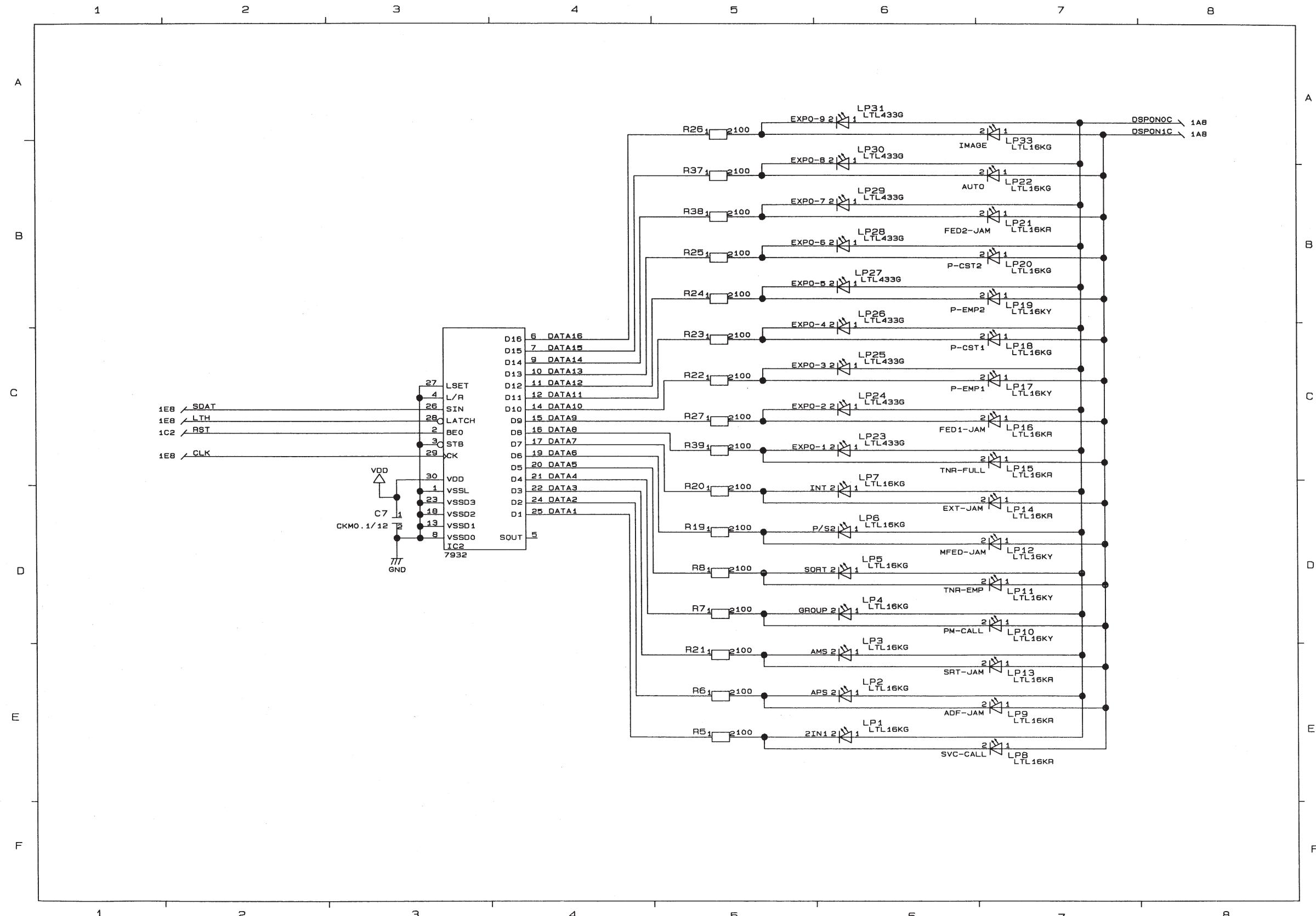


Control Panel Circuit (PWA-F-PNL) 2/4



1 HINT

How to search for where a signal in circuit diagram has jumped to.

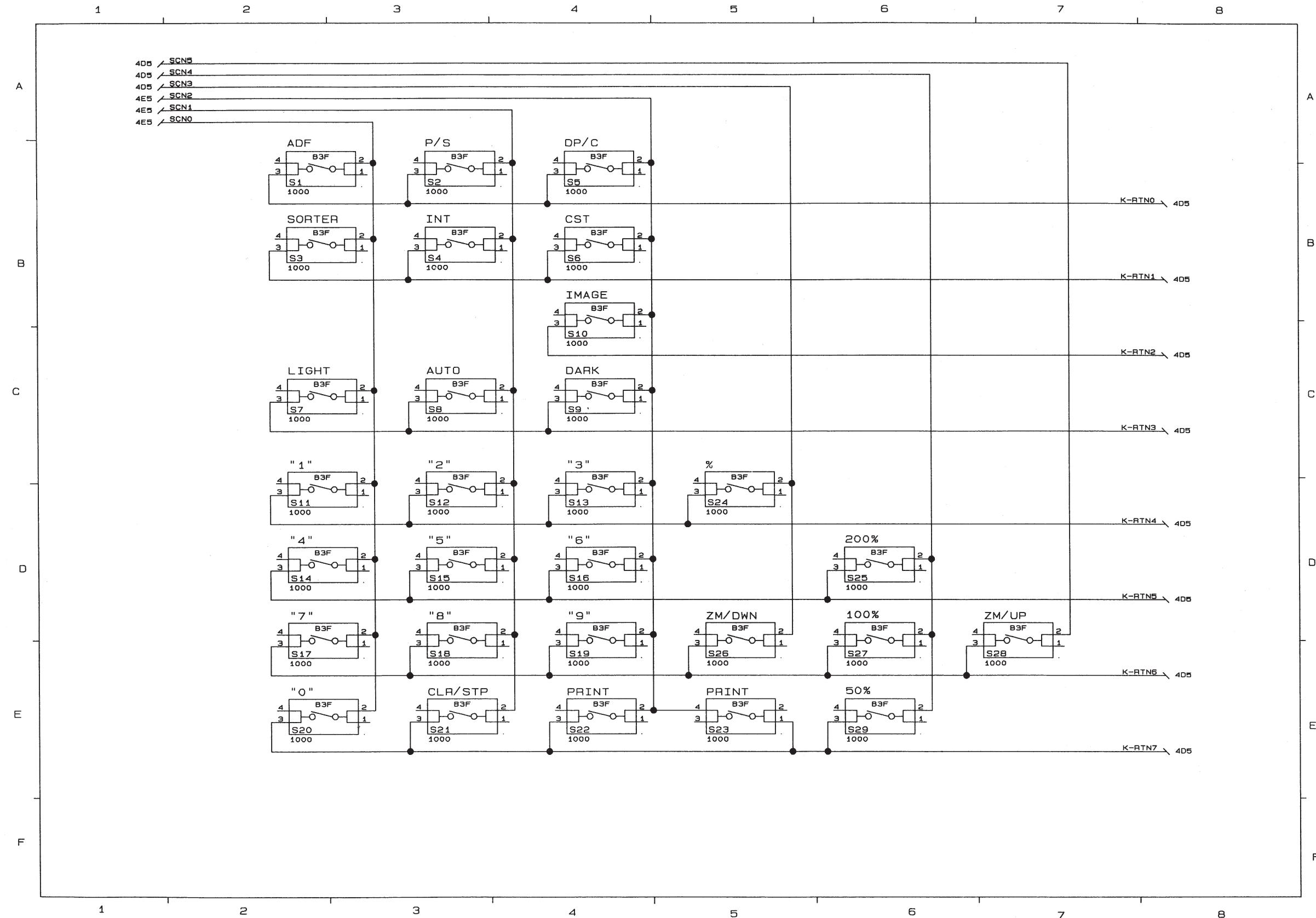


Control Panel Circuit (PWA-F-PNL) 3/4

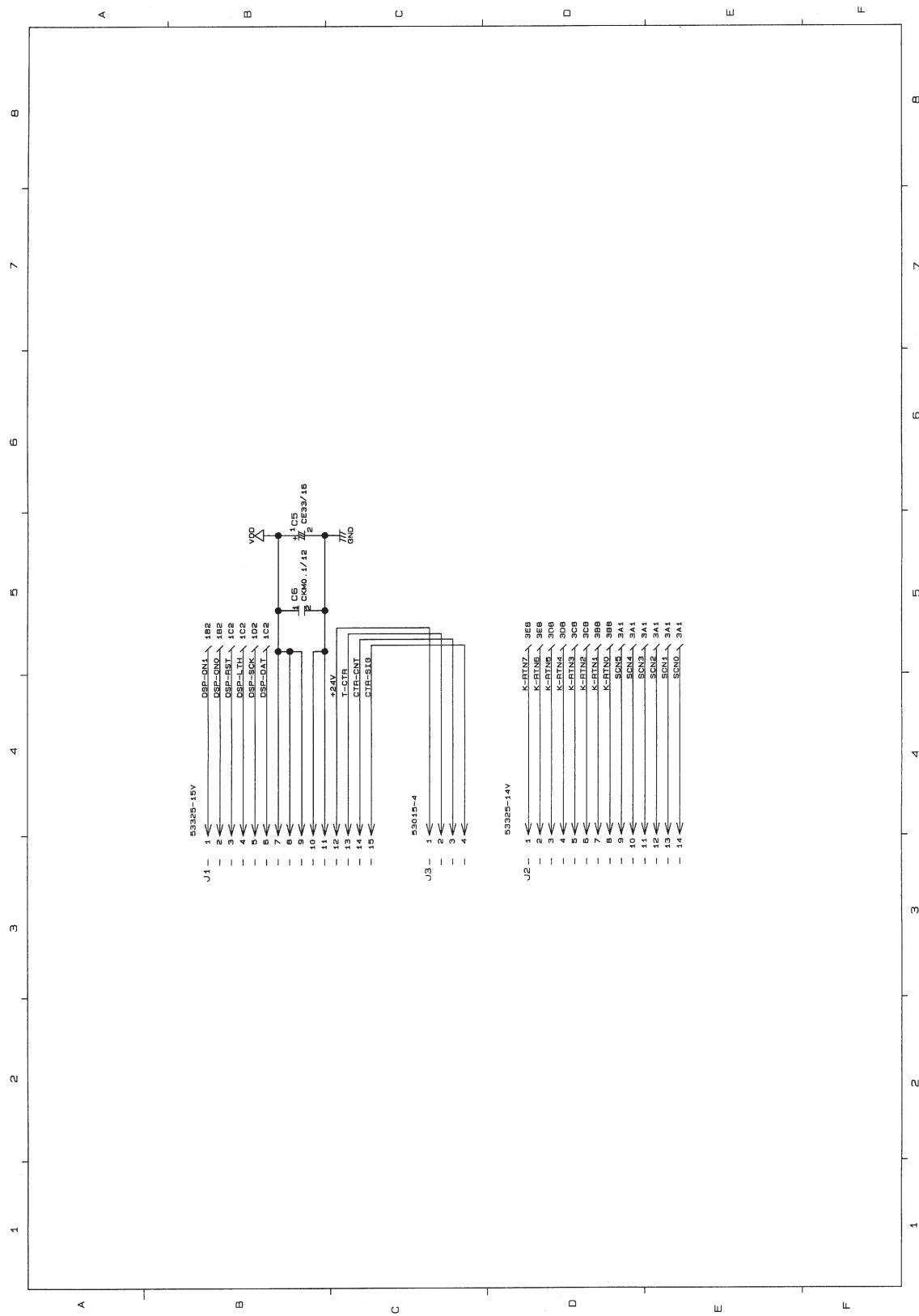


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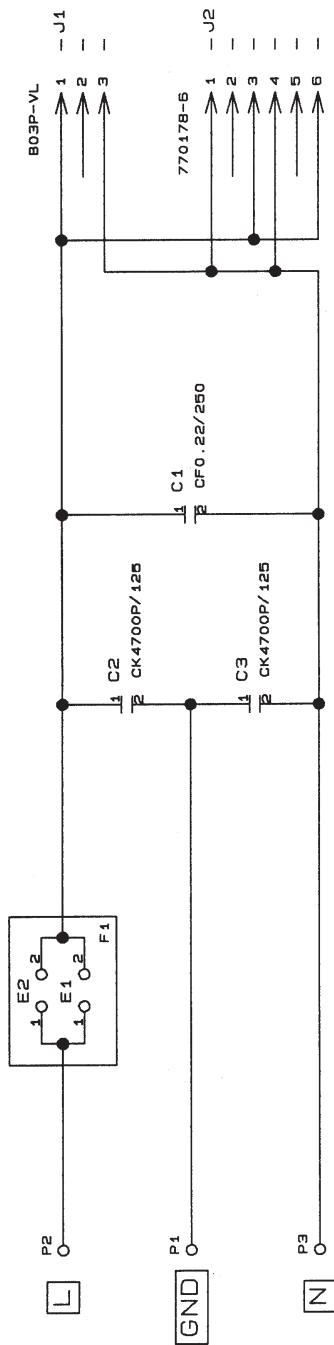
How to search for where a signal in a circuit diagram has jumped to.



Control Panel Circuit (PWA-F-PNL) 4/4



14.4 Fuser Circuit (PWA-F-FUS)



15. POWER STABILIZING CIRCUIT (AC UNIT)

15.1 General Description

This power supply circuit has the following outputs:

① DC outputs:

- +5V : Supplied to LSIs, logic ICs, driver ICs, etc.
- +5VE : Power supply for LED eraser array (DCH).
- +24VA : Power supply for the main motor (M1).
- +24VB : Power supply for clutches and high-voltage transformer.
- +24VC : Power supply for the optional sorter.
- +24VD : Power supply for the optional ADF.

② AC outputs:

- For driving the heater lamp
- For driving the lamp regulator

③ Other control signals:

- Zero-cross output : Zero-cross interrupting signals
- AC OFF signal : Reset signals

15.2 Explanation of Circuit Operation

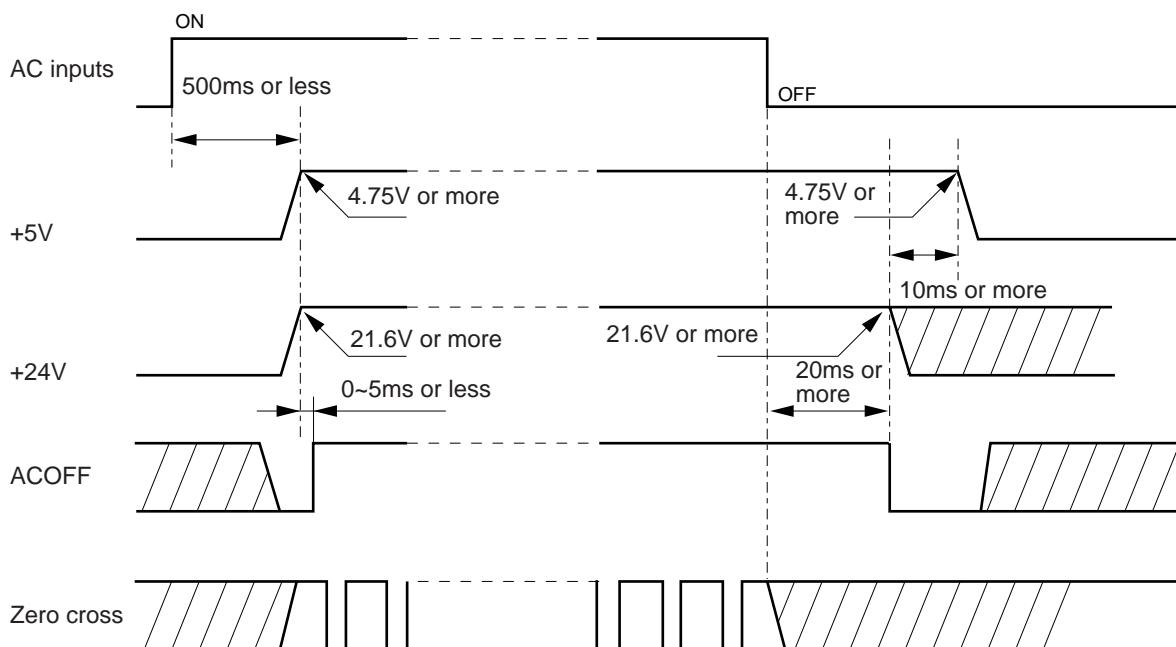
(1) DC + 24V

The +24V system, which is a rated voltage circuit based on the switching method, is always controlled to provide a fixed output voltage by feeding back fluctuation in the output to the primary side through a photocoupler.

(2) DC + 5V

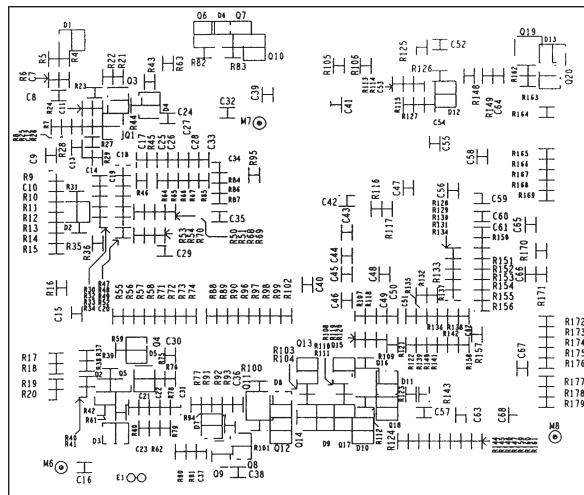
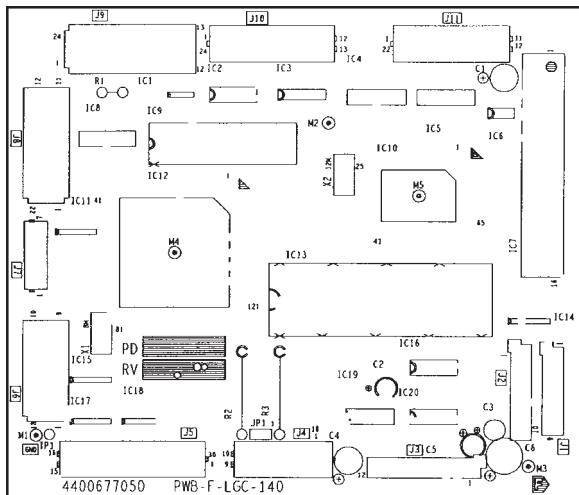
The +5V system is for providing a regulated 5V output by stabilizing the voltage from the 5V winding by means of a 3-terminal regulator.

The following shows the output sequence of the power supply.

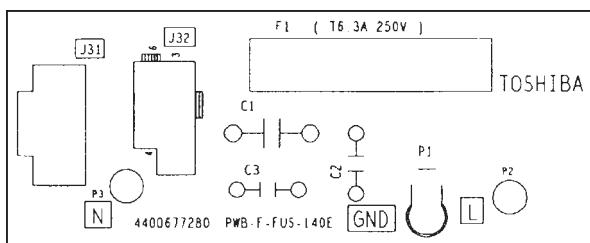
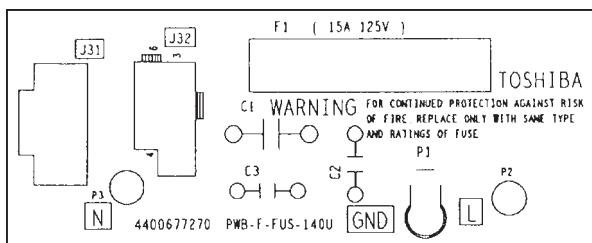


16. PC BOARD ASSEMBLY

16.1 PWA-F-LGC



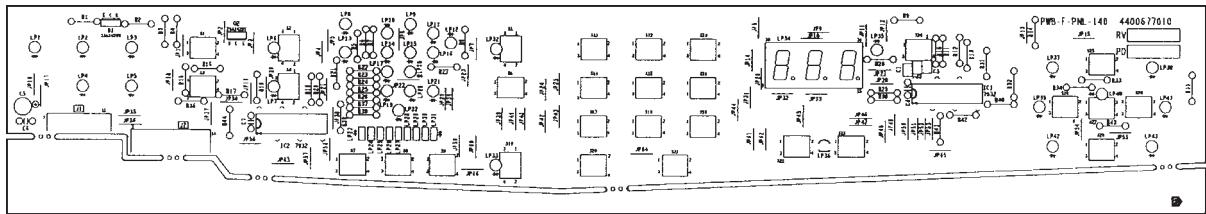
16.2 PWA-F-FUS



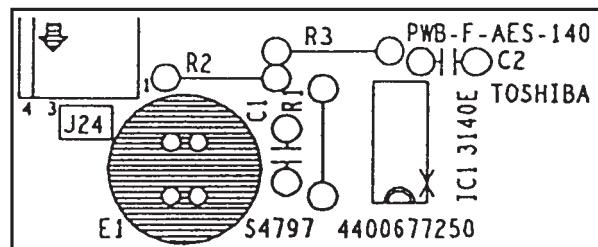
100V series

200V series

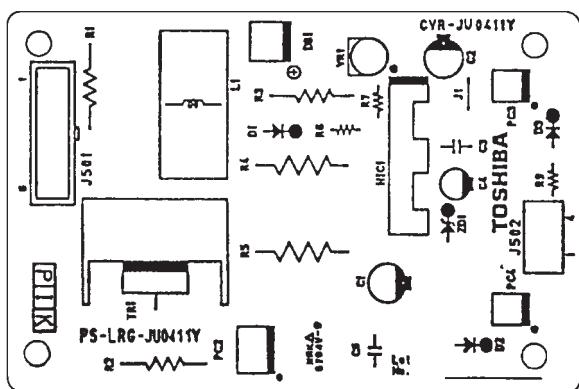
16.3 PWA-F-PNL



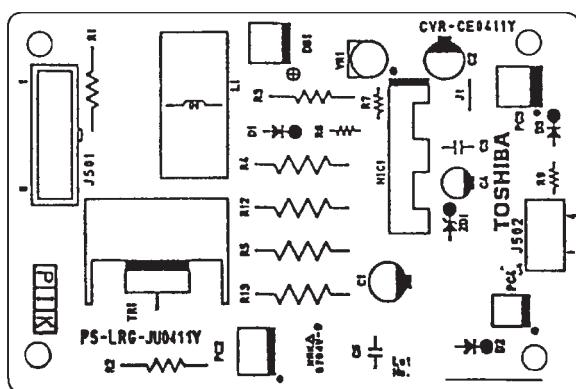
16.4 PWA-F-AES



16.5 PWA-F-LRG



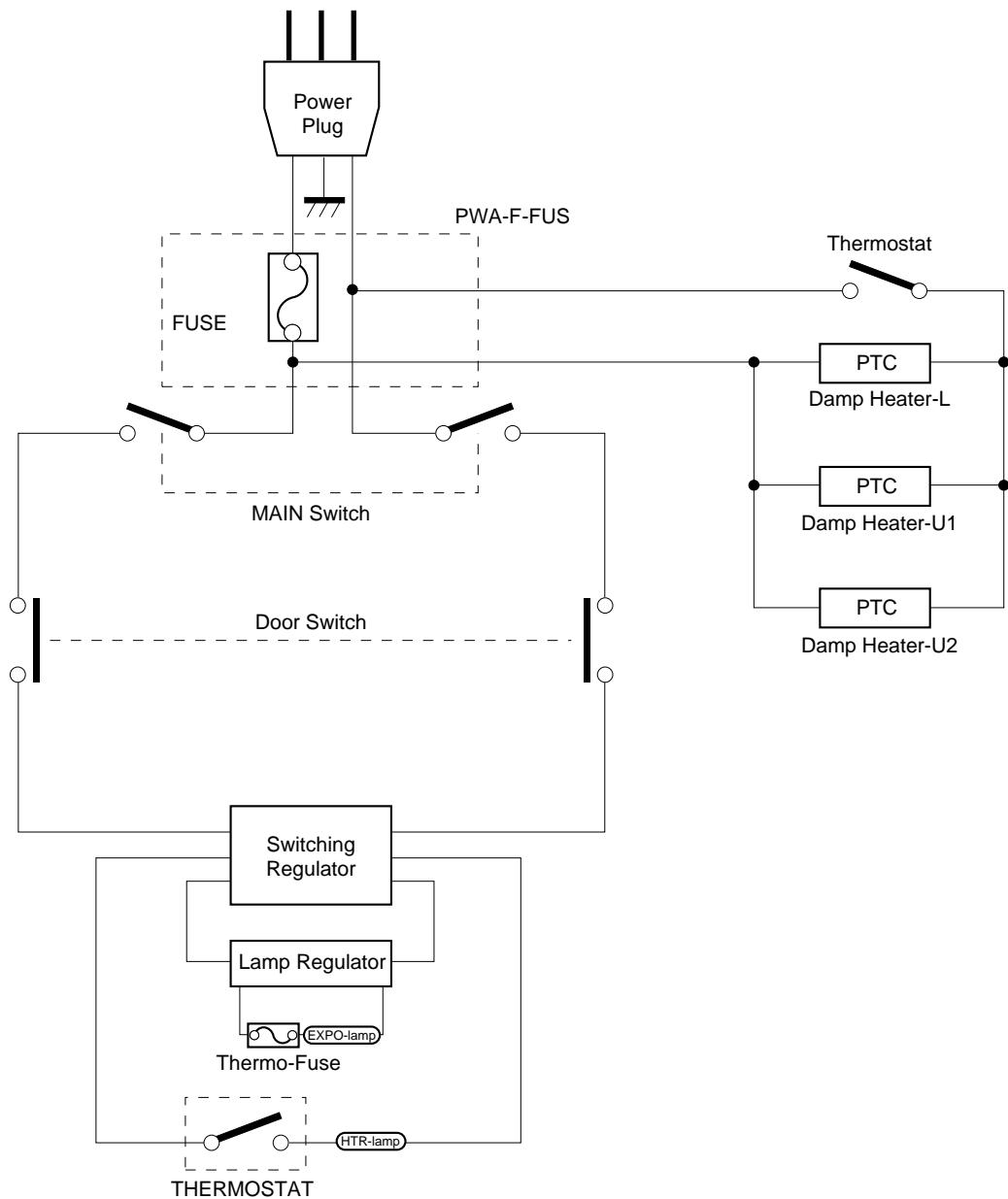
100V series



200V series

17. HARNESS CONNECTION DIAGRAM

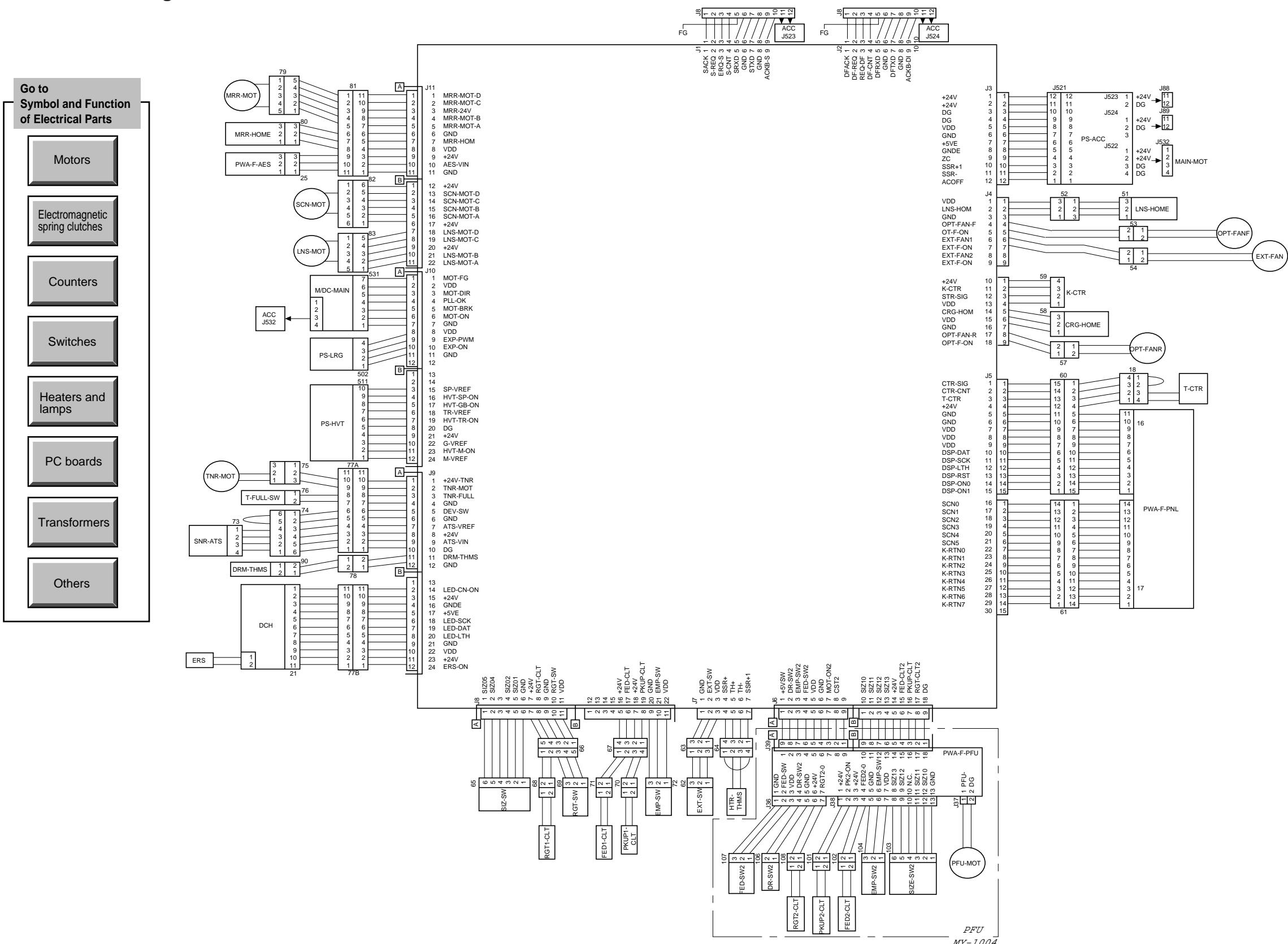
17.1 AC Harness Connection Diagram

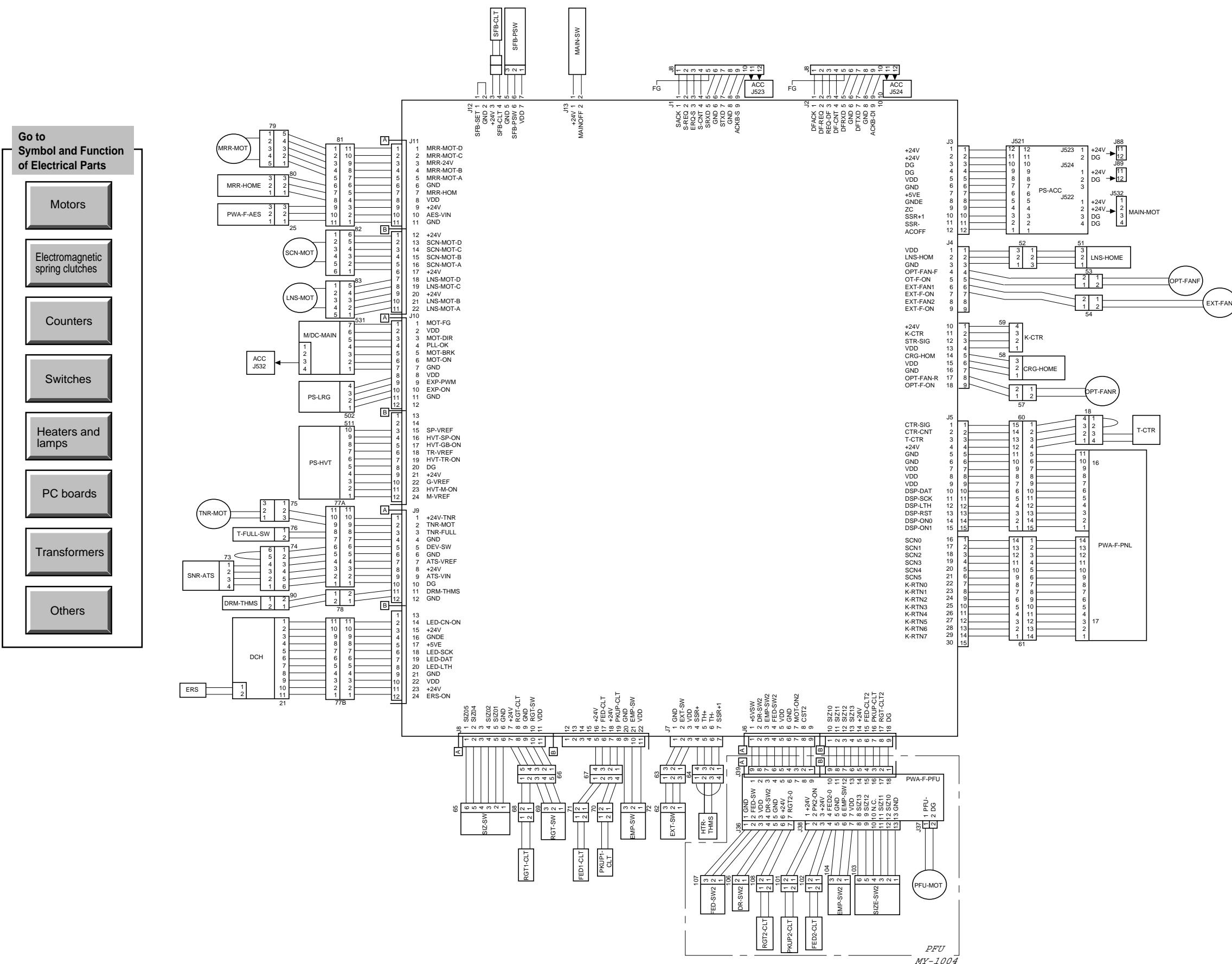


AC Control Circuit

17.2 DC Harness Connection Diagram

17.2.1 1550



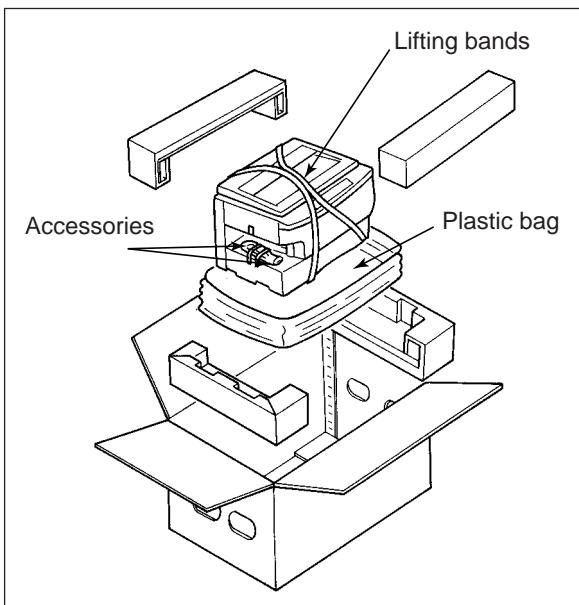


18. UNPACKING PROCEDURE

18.1 Unpacking and Set-up Procedure for the 1550

A. Unpacking Procedure

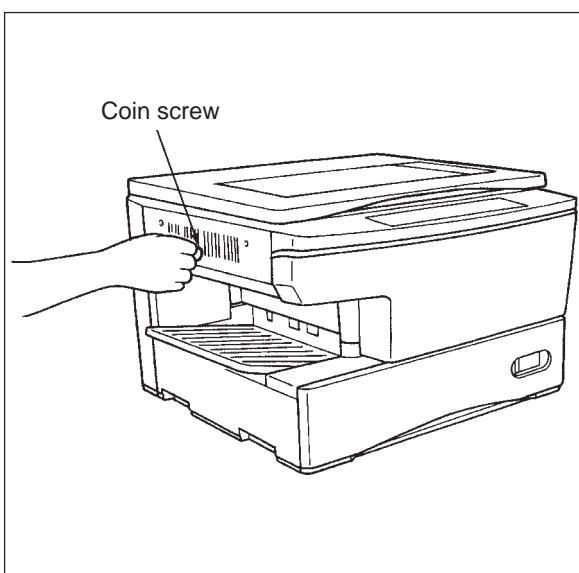
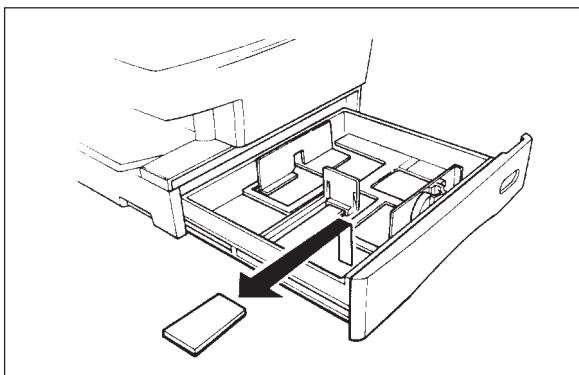
1. Open the carton and take out the accessory package and other packing materials. The accessory package includes the following parts:
 - Copy receiving tray
 - Set-up report (U.S.A., Canada, Europe)
 - Operator's manual
 - Fuser unit lever caps (2 pcs.)
 - Set-up instruction



2. Open the plastic bag and holding the lifting bands, take out the machine from the carton.
3. Remove all packing materials from the outside and inside of the machine.
4. Pull out the cassette and take out the packing material located at the front side.
5. Remove the screw fastening the carriage.

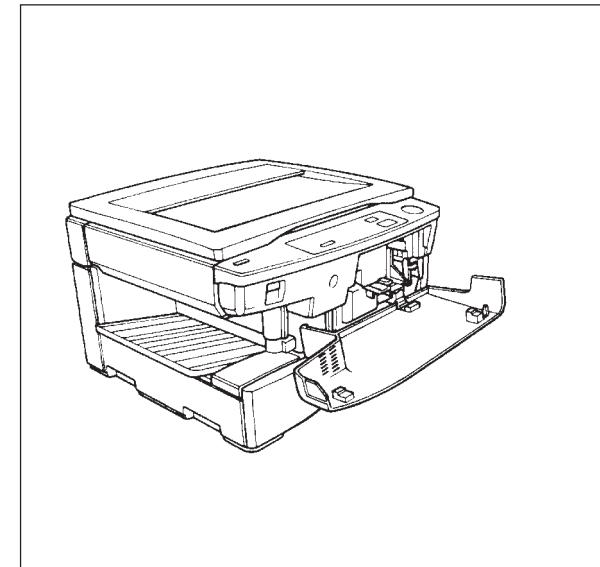
Note: For the screw fastening the carriage, a coin screw is used. So, after loosening it with a suitable coin, the screw can be removed by manually turning it.

- Remove the carriage fastening screw located in the left-top cover.



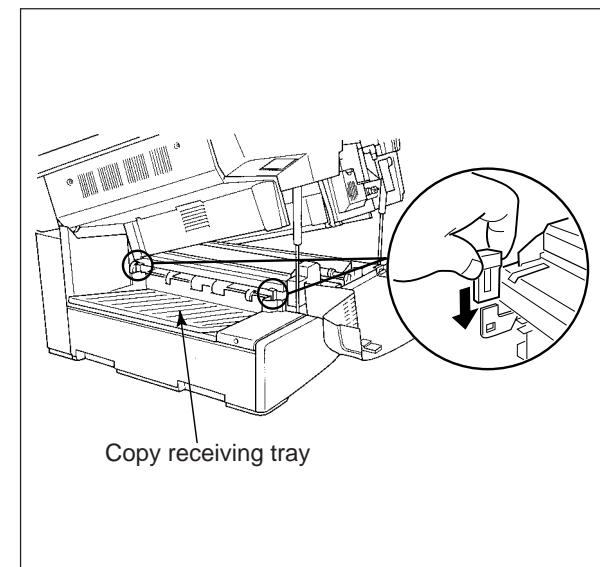
6. Open the front cover:

- Open the front cover and raise the upper unit.



7. Install the fuser unit lever caps (2):

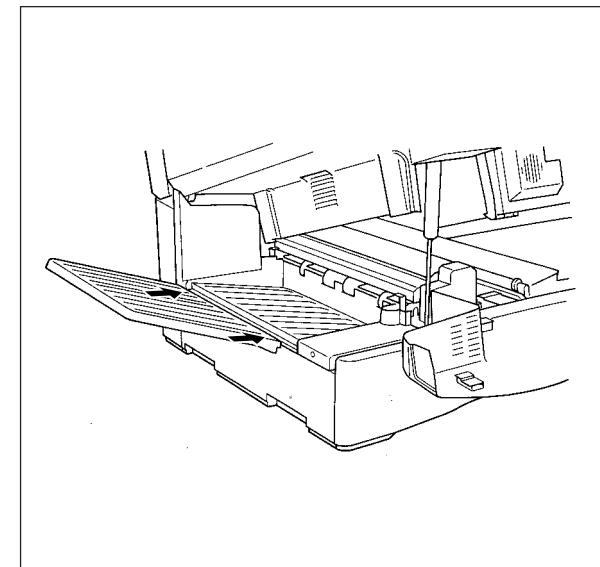
- * The lever caps are provided in the accessory package.
- Securely fit the lever caps onto front and rear levers.



B. Set-up Procedure

1. Installing the copy receiving tray

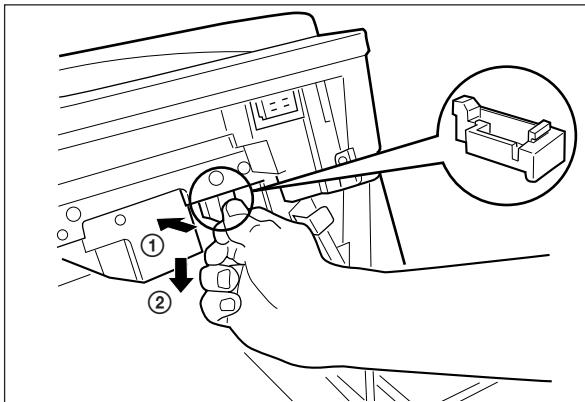
- Install the copy receiving tray by fitting it into the holes in the left-side cover.



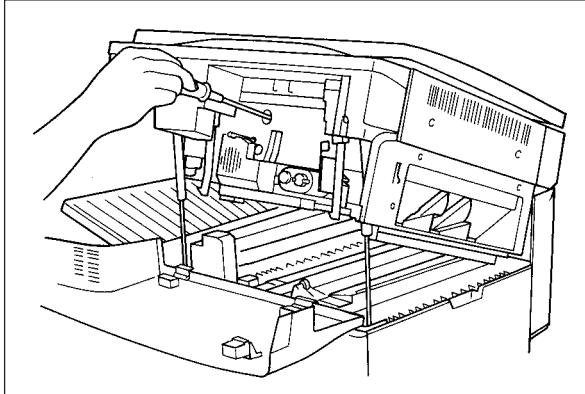
2. Setting the developer unit

(1) Remove the part fastening the lens unit from the machine.

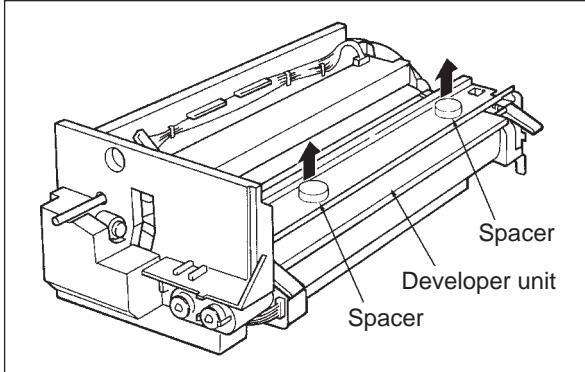
- Push it to the rear side and lower it simultaneously to remove it.



(2) Take out the process unit (1 screw).



(3) Remove the developer unit spacer from the process unit.



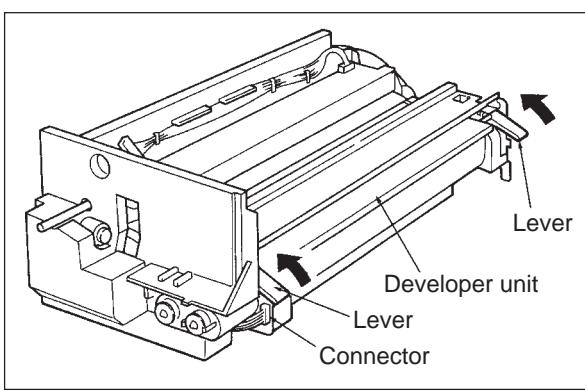
(4) Place the process unit on a flat surface.

Raise the lever located on each side of the process unit in the direction of the arrow.

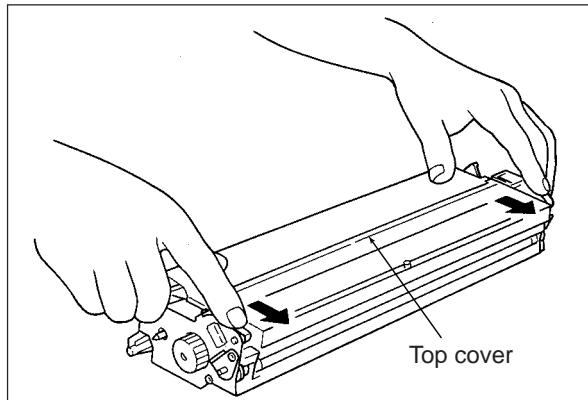
(5) Pull out one connector.

(6) Take out the developer unit from the process unit.

Note: If the photoconductor is exposed to fluorescent light or external light for long time, it may suffer from light-caused fatigue. So, be sure to cover the process unit with, for example, a suitable cloth.



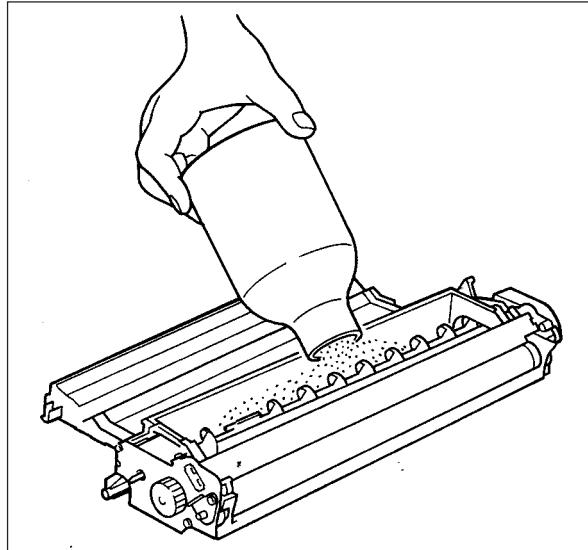
(7) Push the hook located on each side of the developer unit with your fingers in the direction of the arrows to disengage them and then remove the top cover.



(8) Pour in the developer material.

Note: Before pouring in the developer material, be sure to shake the developer bottle fully.

(9) By rotating the magnetic roller, check to make sure that the developer material is transported properly.



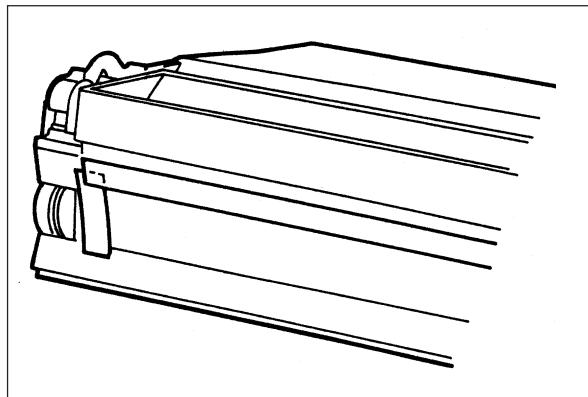
(10) Reinstall the top cover. The two hooks should be securely latched.

Make sure that the top cover is securely closed. Also, make sure that the rubber seal of the top cover is positioned outside of the side seals (both sides).

(11) After placing the developer unit in the process unit, move down the lever on each side by 90° to fix the developer unit. Be sure to insert the connector securely.

(12) Reinstall the process unit into the machine (1 screw).

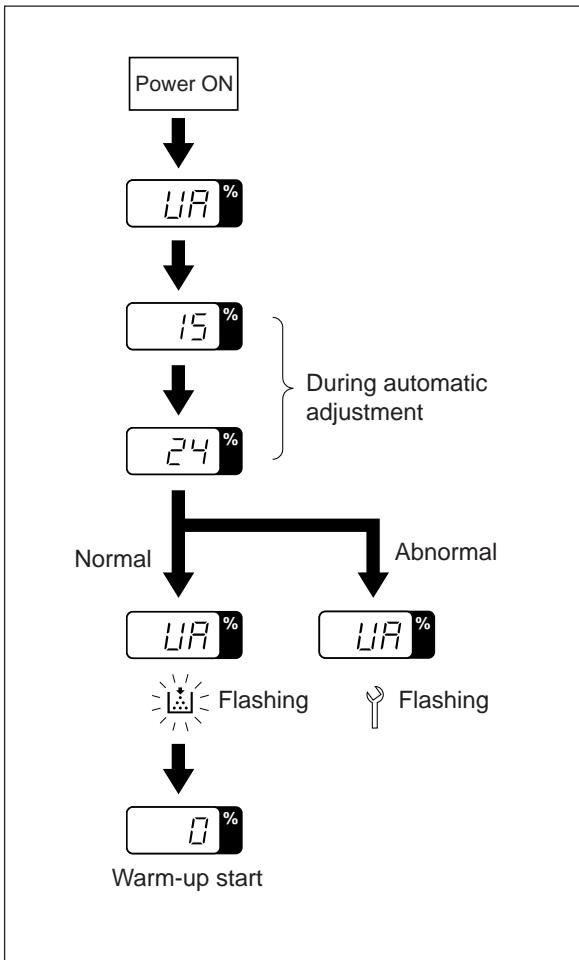
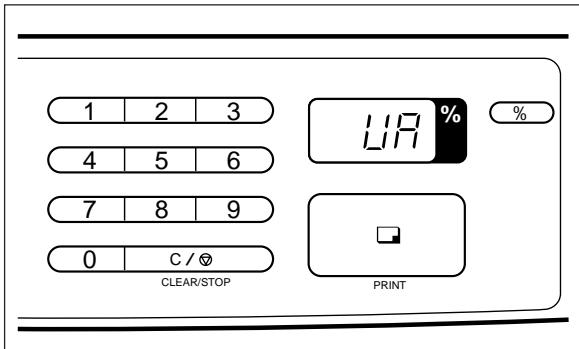
Note: Be sure not to install the toner cartridge at this time.



C. Adjustment Procedure

1. Automatic adjustment of the auto-toner sensor

- (1) When the power switch is turned on, the auto-toner sensor is automatically adjusted by the following procedure.
- (2) "UA" is shown on the copy quantity display and the PRINT key lights in red. And the automatic adjustment of the auto-toner sensor starts.
- (3) The machine starts its operation. The output value of the toner sensor is shown on the display and changes quickly.
- (4) About 2 minutes and 30 seconds later, the value on the display stabilizes at 23 – 25.
- (5) About 30 seconds later, the automatic adjustment of the auto-toner sensor is complete and "UA" is shown on the copy quantity display. Also, the ADD TONER  is displayed.
- (6) Open the front cover and install the toner cartridge.
- (7) Close the front cover.
 - If the adjustment has finished abnormally, the machine stops its operation and displays the CALL SERVICE . Then, for the subsequent adjustment of the auto-toner sensor, follow the procedure described in the Service Manual.



D. Final Operation Check

Making copies in both the cassette and bypass feeding modes, check the following items:

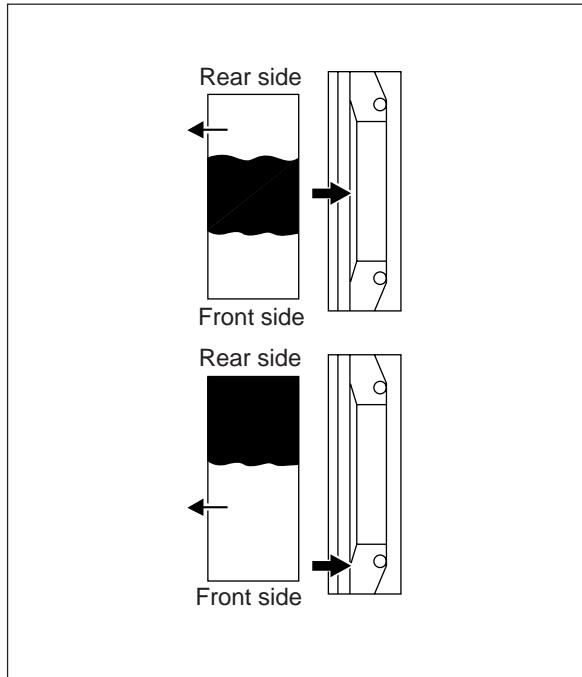
- Check for correct paper feeding from both the cassette and sheet bypass.
- Check for proper copy image.
- Check for correct displaying of the control panel lamps and the correct operation of the keys.

Note: Dispose of the packing materials properly.

E. Changing the Image Settings

1. Light distribution adjustment

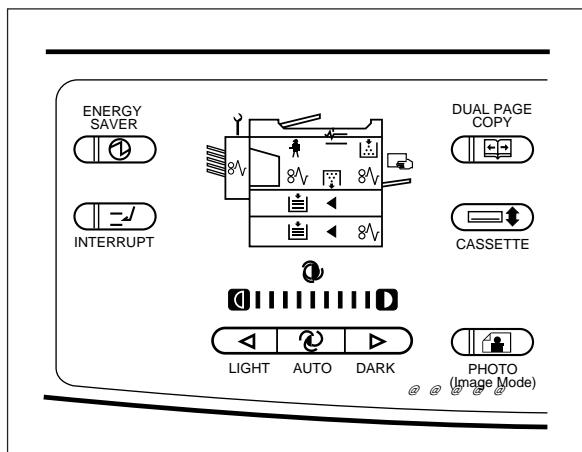
- (1) With the exposure set at a darker point, make a copy of the test chart and check for uneven light distribution.
- (2) If necessary, make adjustment in the following manner:
 - a) Turn off the power and unplug the power cord plug. Then, remove the right-hand top glass holder (2 screws) and the glass.
 - b) Loosening the screw of the adjustment plate corresponding with the position of the uneven light distribution, adjust the plate:
If you move it toward the left, copy image becomes darker and if you move it toward the right, copy image becomes lighter.
 - c) If the rear side of the copy is too dark and gradually lighter toward the front, adjust the adjustment plates as shown on the right (lower).
 - d) Make a copy of the test chart and check for the correct image density.



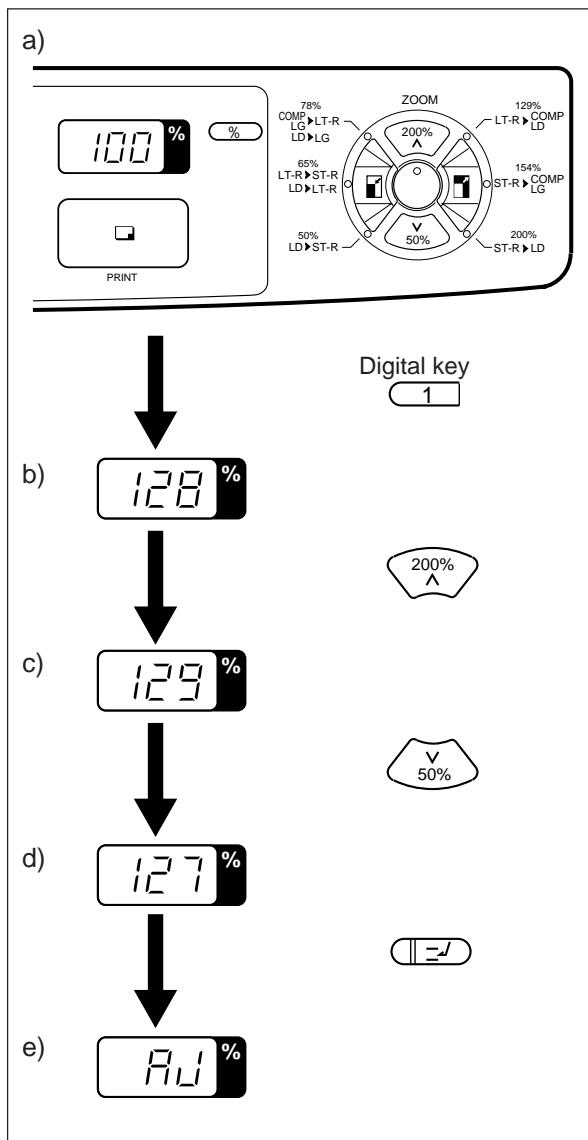
2. Exposure adjustment

2.1 Adjustment of manual exposure (100%)

- (1) Turn off the power of the machine. While pressing keys **0** and **5** simultaneously, turn on the power switch.
 - Check that the "AJ" mode is shown.
- (2) Press the Auto Exposure **◎** key to switch to manual exposure. (Check that the Auto Exposure lamp has gone off.)
- (3) Using the exposure keys, set the exposure level at the center point.



- (4) Press the 100% key to set at 100% mode.
- (5) To check the current image density, press the ENERGY SAVER INTERRUPT key to make a test copy.
- (6) If the image density is not appropriate, make adjustment using the following procedure:
- (7) Key in code "1" from the 10-key pad and press the PRINT PRINT key.
 - The current adjustment value is shown on the display.
- (8) If the image density is too high, increase the value by using the ZOOM UP $\text{200\% } \wedge$ key.
- (9) If the image density is too low, reduce the value by using the ZOOM DOWN $\text{50\% } \vee$ key.
- (10) Press the INTERRUPT INTERRUPT key to cause the new value on the display to be memorized.
 - After you press the key, the display returns to "AJ".
 - Press the ENERGY SAVER INTERRUPT key to make a test copy.
- (11) If the image density is not appropriate, repeat steps (7) – (10) above.



2.2 Adjustment of manual exposure (50%, 154% and 200%)

Note: Before performing manual exposure adjustment (50%, 154% and 200%), check to make sure that manual exposure adjustment for 100% has been properly done.

- (1) Make copies at 154%, 50% and 200% reproduction ratios, respectively. (In the "AJ" mode, if you press the ENERGY SAVER INTERRUPT key, copies will be made.)
- (2) If the image density is not appropriate for certain reproduction ratios, perform manual exposure adjustments (a), (b) or (c) in Sec. 2.4 for the inappropriate ratios.

2.3 Automatic adjustment of auto exposure

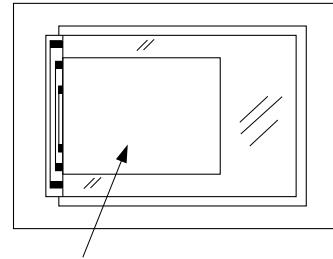
(50%, 100%, 154% and 200%)

Note: Before performing automatic exposure adjustment, check to make sure that manual exposure adjustment for 100% has been properly done.

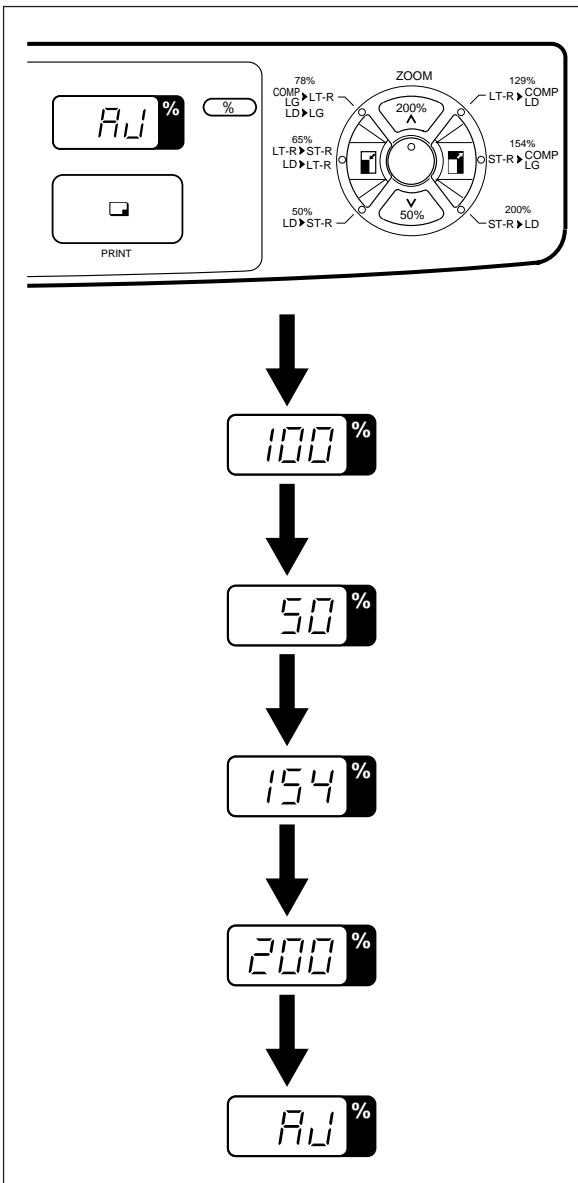
- (1) Make sure that "AJ" is shown on the display.
- (2) Place blank A3-sized (or Ledger-sized) copy paper on the glass and set it against the original scale, then close the original cover.
- (3) After keying in code "49", press the PRINT  key and the automatic adjustment of auto exposure commences. (The carriage, lens unit and mirror unit, respectively, move to the positions corresponding to the four reproduction ratios, making the exposure lamp also to light four times.)

Note: Do not touch the machine while it is performing automatic exposure adjustment.

- (4) When the display changes to "AJ", the automatic adjustment is complete.
- (5) Make copies at the respective reproduction ratios and check the image density. (In the "AJ" mode, simply press the ENERGY SAVER  key to make copies.)
- (6) If the image density of test copies is not appropriate for any reproduction ratio, make adjustments in Sec. 2.4 Automatic exposure adjustment (d), (e), (f) or (g) for the inappropriate reproduction ratio.



Blank copy paper



2.4 Manual adjustment of exposure

Note: Only when the user is not satisfied with the results of the exposure adjustments in Sec. 2.2 and 2.3, perform the manual adjustments of exposure (a) – (m) as described below.

Adjustment procedure	Exposure mode	Reproduction ratio	Adjustment code
(a)	Manual exposure center	154%	2
(b)		50%	3
(c)		200%	4
(d)	Automatic exposure	100%	5
(e)		154%	6
(f)		50%	7
(g)		200%	8
(h)	Light (max.)	100%	9
(i)	Dark (min.)	100%	10
(j)	Photo exposure	100%	14
(k)		154%	15
(l)		50%	16
(m)		200%	17



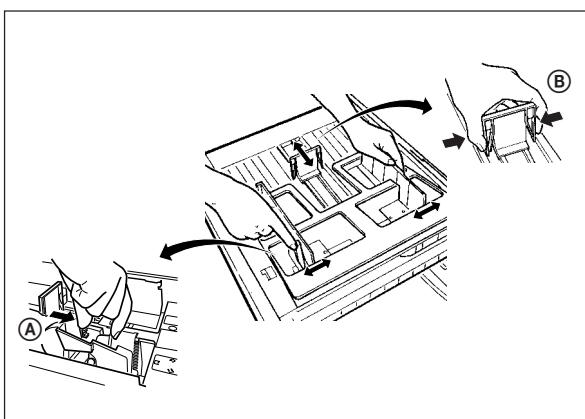
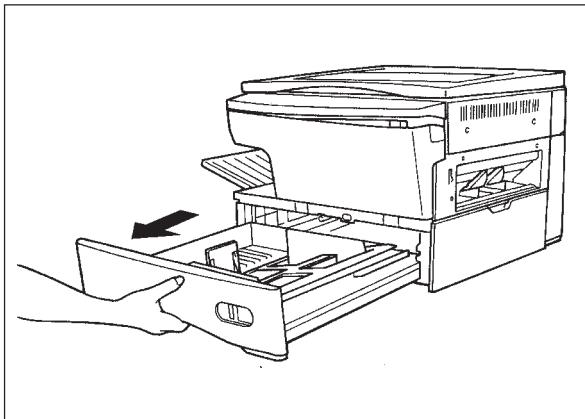
Adjustment Procedure

- (1) Make sure that "AJ" is shown on the display.
- (2) Set exposure mode .
- (3) Set reproduction ratio  using the REDUCE , ENLARGE , ZOOM DOWN  or ZOOM UP .
- (4) To check the current image density, make test copies in the manual, automatic and photo modes and check them for proper image density.
- (5) Key in adjustment code  and press the PRINT  key.
Then, using the procedure of (7) – (11) in Sec. 2.1, make adjustments.
- (6) Finally, press keys  and  simultaneously to clear the test mode.

Changing the Paper Size of the Cassette

(1) Pull out the cassette and push down the bottom plate. Then move the both side guides and trail-edge guide to align them to the desired size.

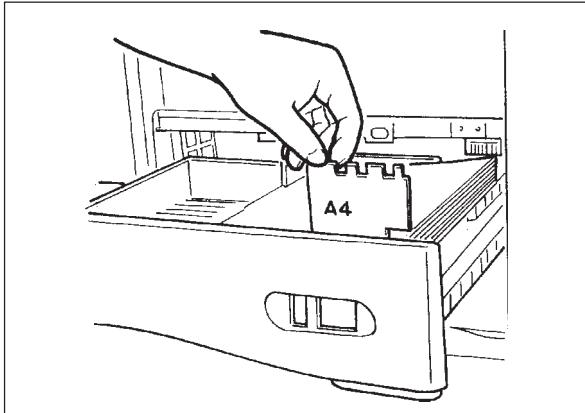
- Before moving the side guides, push the lever in the direction of Ⓐ to unlock the side guides.
- Before moving the trail-edge guide, push on its sides in the direction of Ⓑ to unlock the guide.



(2) Take out the paper size plate from the cassette and reset it to show the desired size on the display.

(3) Place the paper on the cassette and check the gaps between the paper and the side guides.

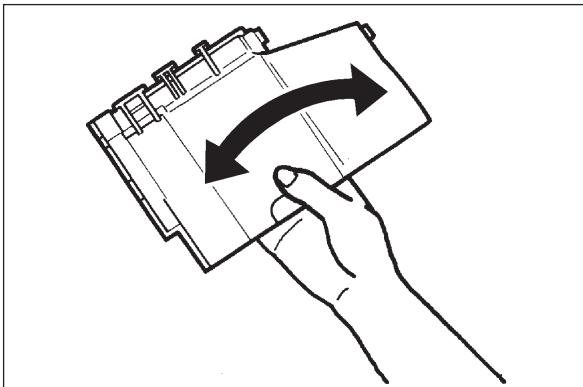
(4) Insert the cassette gently.



Procedure for Installing the Toner Cartridge

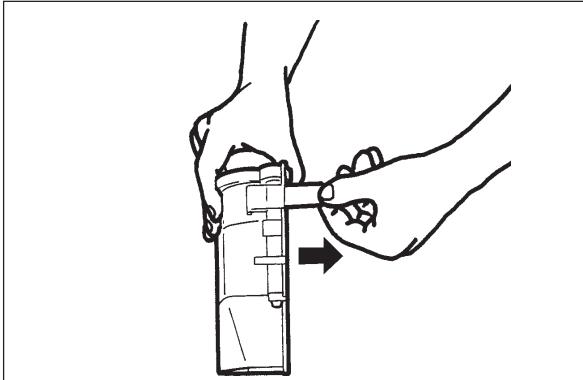
(1) Open the front cover and pushing the lock lever, take out the toner cartridge from the front side.

(2) Shake the new toner cartridge to the right and to the left 5 or 6 times to loosen the toner inside.



(3) Pull to remove the seal from the new toner cartridge.

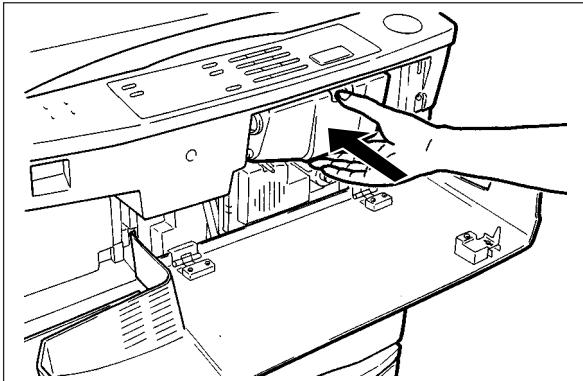
- Do not shake the toner cartridge after removing the seal (The toner may spill).



(4) Install the new toner cartridge in the machine.

- Push the toner cartridge fully in until it is locked securely.

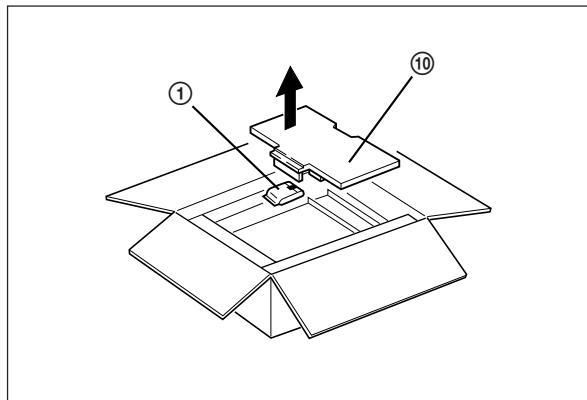
(5) Close the front cover.



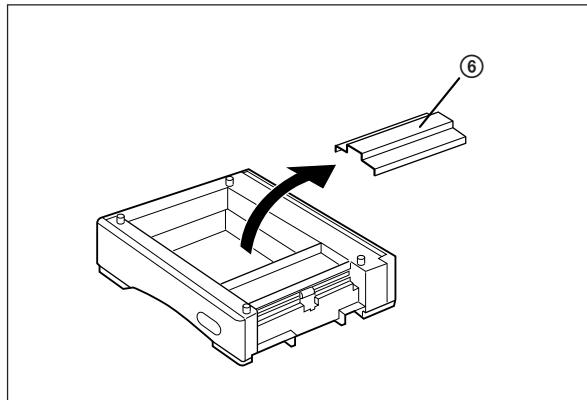
18.2 Unpacking and Set-up Procedure for the Paper Feeding Unit MY-1004

A. Unpacking Procedure

- (1) Open the carton and take out the package ① and the paper guide ⑩.
- (2) Remove packing materials and take out the paper feeding unit MY-1004.



- (3) Remove packing material ⑥.

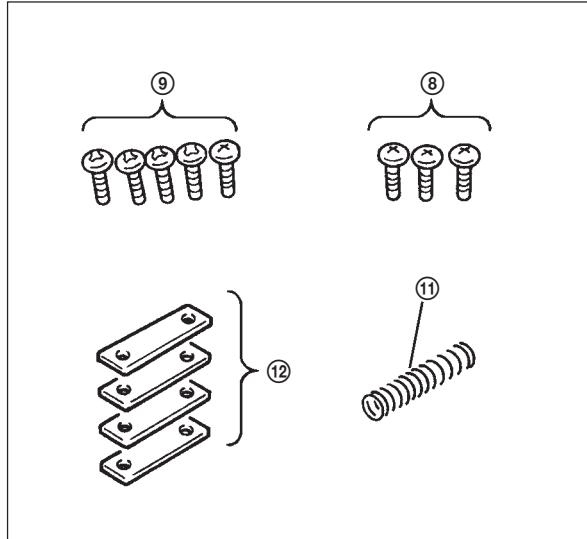


- The following parts are included in the package ①:

Tapping screws (M4 x 8, 3 pcs.)	⑧
Screws (M4 x 6, 5 pcs.)	⑨
Separation roller pressure	
spring (1 pc.)	⑪
Fixing plates (4 pcs.)	⑫

[Reference]

The applicable model is the ED-1550.



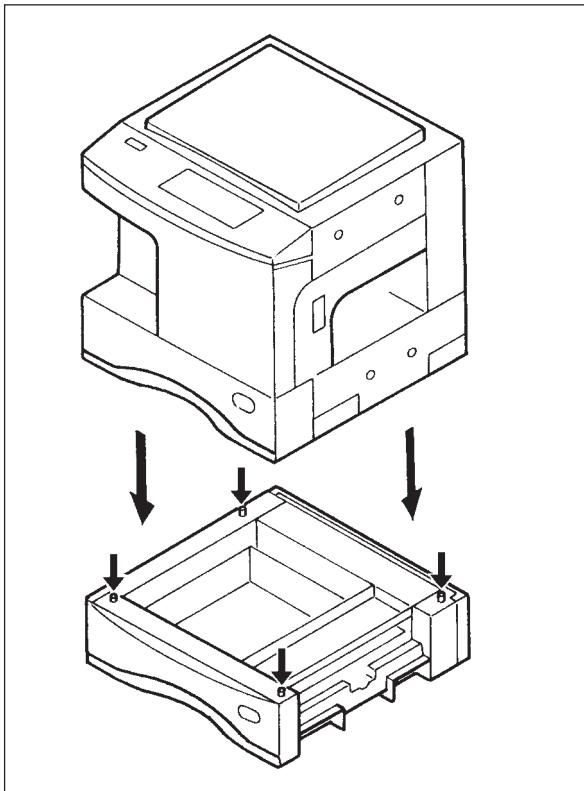
B. Installation Procedure

1. Docking the MY-1004 with the copier

- (1) Place the MY-1004 on the copier stand.
- (2) Using two people, lift the copier and place it slowly onto the MY-1004 so that the copier's cassette guide holes (not shown in the diagram) are aligned with the MY-1004's positioning pins.

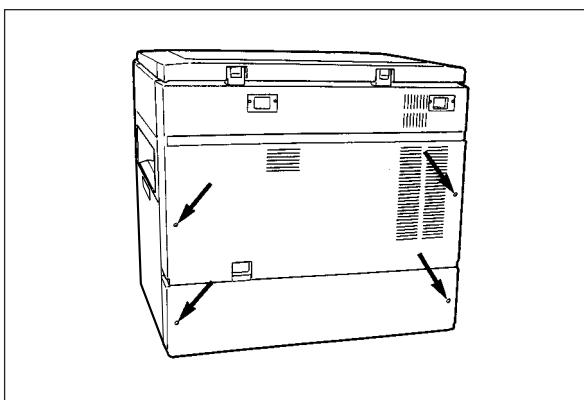
Notes: 1 When docking the MY-1004 with the copier, aligning the front and right-hand surfaces of the copier with those of the MY-1004, respectively, will make the installation easier.

- 2 Before the copier and the MY-1004 are fastened with screws (4 places), do not move or carry them to another place.

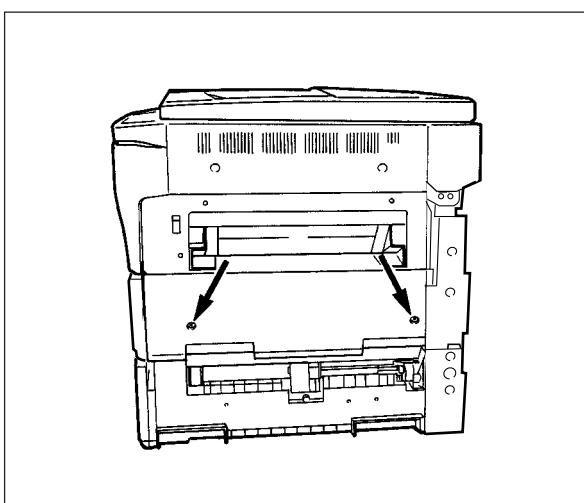


2. Removing the covers

- (1) Remove the rear cover of the MY-1004 (2 screws).
- (2) Remove the rear cover of the copier (2 screws).

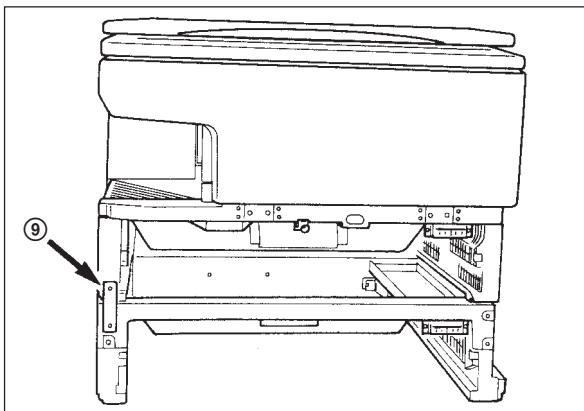


- (3) Remove the lower feed side cover of the copier (2 screws).

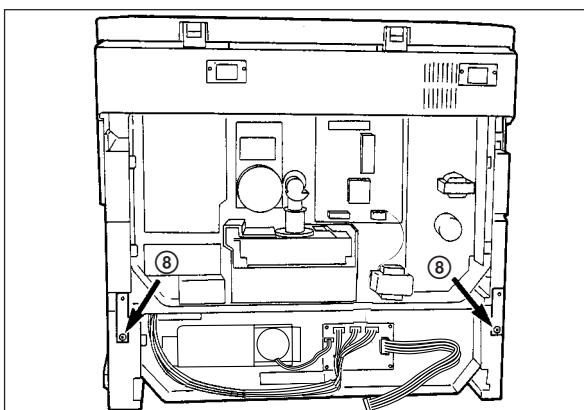


3. Fastening the MY-1004 and the copier

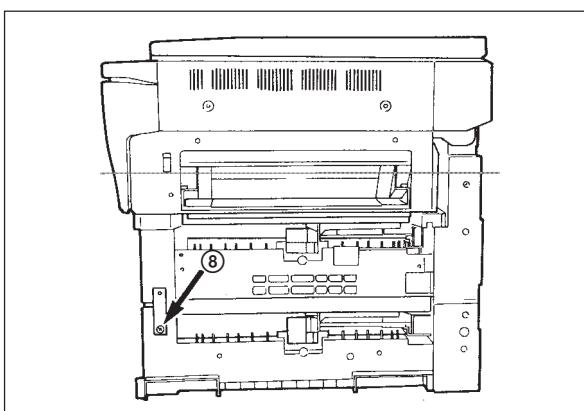
- (1) Remove the cassettes from the copier and the MY-1004, respectively.
- (2) Using the fixing plate and screws (⑧, ⑨) provided, fasten the copier and the MY-1004 as shown in the Figure.



One place at the front



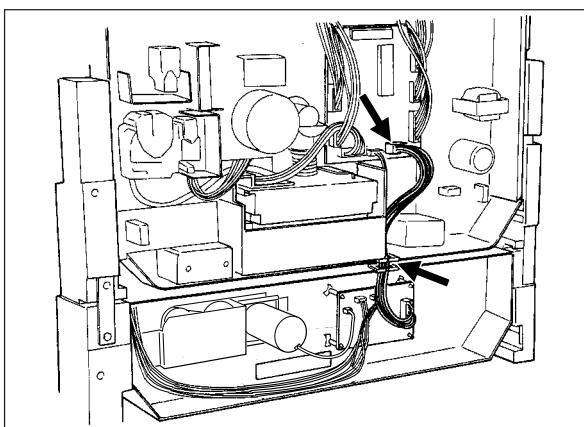
Two places on the rear



One place on the feed side

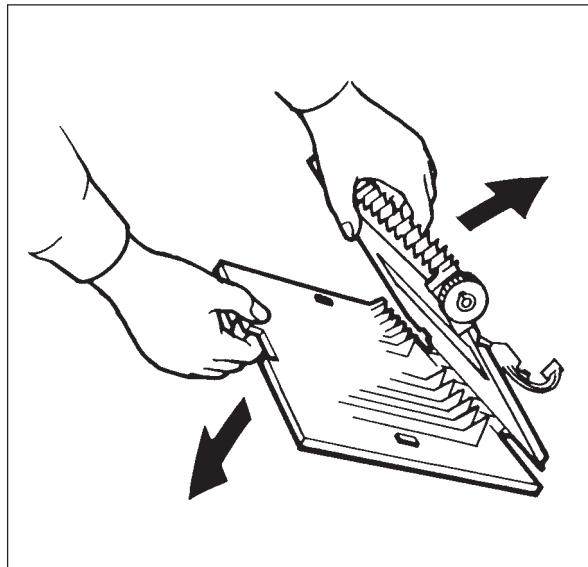
4. Installing the wire harness:

- (1) Fit the wire harness on the rear of the MY-1004 into the respective edge saddles of the copier and the MY-1004 and connect the harness to the J6 connector of the copier's PC board.

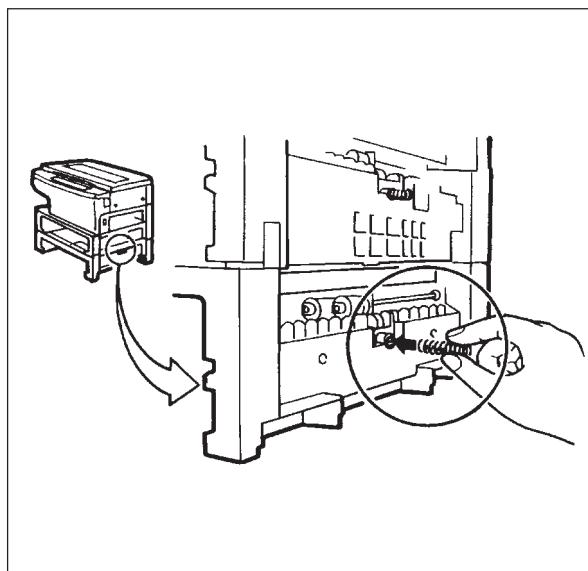


5. Installing the paper guide

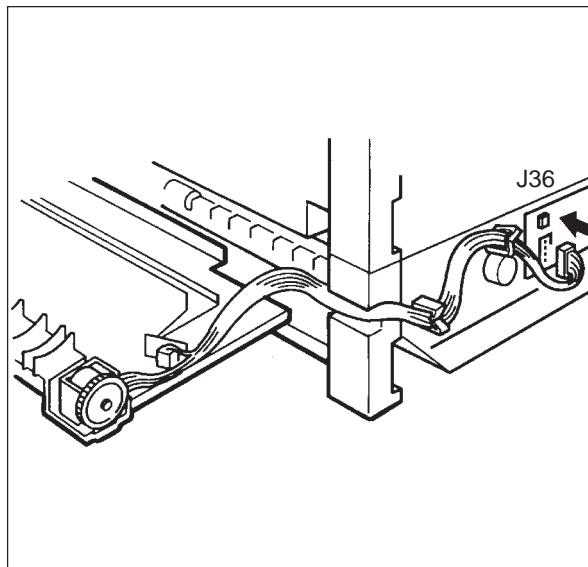
(1) The paper guide ⑩ provided has its metal guide section and outer panel section joined by magnets.
Separate them when installing the paper guide.



(2) Insert the separation roller pressure spring ⑪ (provided) into the hole in the separation roller holder at the feed side of the MY-1004.



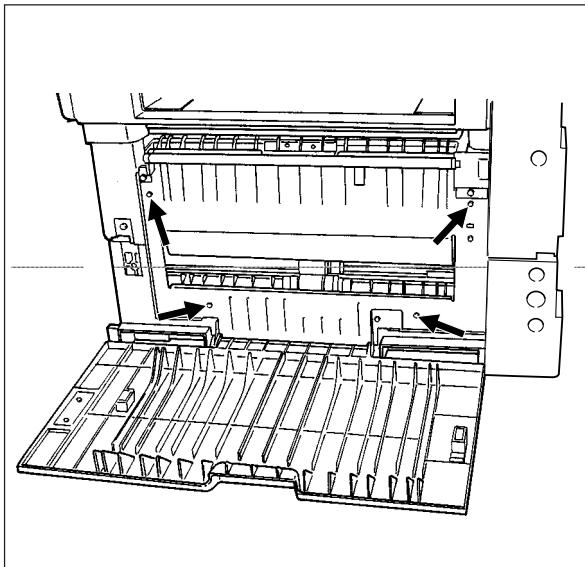
(3) Plug the connector of the paper guide ⑩ into the connector J36 from the feed side of the MY-1004.



- (4) Fasten the paper guide ⑩ using the fixing screws ⑨ provided, as shown (4 places).

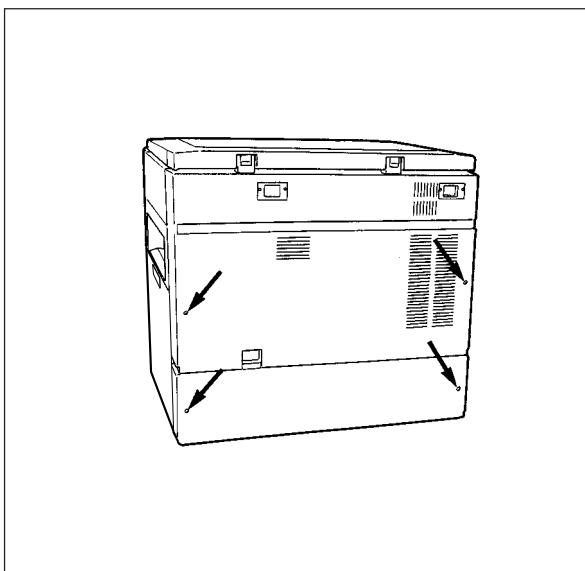
Note: When fastening the paper guide ⑩, check to make sure that the separation roller pressure springs ⑪ are fitted in the separation roller holders of the copier and the MY-1004, respectively.

- (5) Close the outer panel of the paper guide ⑩.



6. Reinstalling the rear covers

- (1) Reinstall the rear covers of the copier and the MY-1004.
- (2) Return the cassettes to the original positions, respectively.



C. Operation Check of the MY-1004

- (1) Plug the copier's power cord into the electrical outlet and turn on the power switch.
- (2) Set sheets of paper in the MY-1004's cassette.
- (3) Selecting the MY-1004's cassette, make a few copies and check that the MY-1004 operates normally.

SERVICE HANDBOOK 1550,1560

PLAIN PAPER COPIER



Click the Page Only button to close the overview area of the window.



Click the Bookmarks and Page button to open the Contents and display bookmarks created for the document. Click a bookmark's name to go to the Page marked by that bookmark.



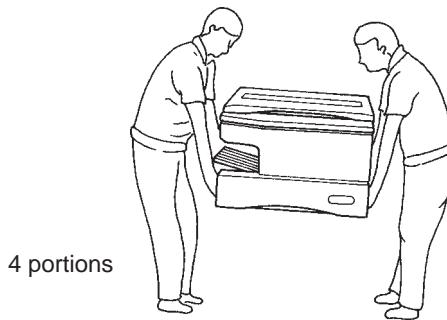
Click the Thumbnails and Page button to open the overview area and display thumbnail images of each document page. Click a thumbnail to go to the page marked by that thumbnail.

GENERAL PRECAUTIONS REGARDING THE INSTALLATION AND THE SERVICE OF THE 1550/MY-1004

1. Transportation/Installation

- When transporting/installing the copier, using two persons, be sure to use the positions as indicated below.

The copier is fairly heavy and weighs approximately 35 kg (76.8 lb), therefore pay full attention when handling it.



2. Installation

- Be sure to use a dedicated outlet with AC 115V/15A (220V, 240V/10A) or more for its power source.
- The copier must be grounded for safety.
Never ground it to a gas pipe or a water pipe.
- Select a suitable place for installation.
Avoid excessive heat, high humidity, dust, vibration and direct sunlight.
- To insure adequate working space for the copying operation, keep a minimum clearance of 80 cm (31.5") on the left, 80 cm (31.5") on the right and 10 cm (3.9") in the rear.

3. Service of Machines

- Basically, be sure to turn the main switch off and unplug the power cord during service.
- Be sure not to touch high temperature sections such as the exposure lamp, the fuser unit, the damp heater and their periphery.
- Be sure not to touch high-voltages sections such as the chargers and the high-voltage transformer.
- Be sure not to touch rotating/operating sections such as gears, belts, pulleys, etc.
- When servicing the machines with the main switch turned on, be sure not to touch live sections such as the lamp terminal etc.
- Use suitable measuring instruments and tools.

4. Main Service Parts for Safety

- The thermofuse, thermistor, fuse, breaker and door switch, etc. are particularly important for safety. Be sure to handle/install them properly.

5. Notice Labels

- Be sure to check the rating plate and the notice labels such as "Unplug the power cord during service", "Hot area", etc. to see if there is any dirt on their surface or if they are properly stuck to the copier during servicing.

6. Disposition of Consumable Parts/Packing Materials

- Regarding the recovery and disposal of the copier, consumable parts and packing materials, it is recommended to follow the relevant local regulations or rules.

7. When parts are disassembled, reassembly is basically the reverse of disassembly unless otherwise noted in this manual or other related documents. Be careful not to reassemble small parts such as screws, washers, pins, E-rings, toothed washers in the wrong places.

8. Basically, the machine should not be operated with any parts removed or disassembled.

1. ADJUSTMENT ITEMS

1.1 Error Code Table

When the "CLEAR PAPER" or "CALL SERVICE" symbol is flashing, pressing the "CLEAR/STOP" key and the "8" key simultaneously causes one of the following error codes to be displayed while the keys are pressed.

(1) Paper misfeeding in the copier paper path

Error code	Content	Remarks
E01	Paper misfeeding inside the copier	Bypass misfeeding is also included. (Bypass feeding LED comes ON.)
E02	Paper misfeeding in the neighborhood of the fuser	
E03	Paper misfeeding inside the copier when the power is turned on.	
E05	Non-arrival-at-aligning-switch misfeeding	After the paper fed from PFU has passed the transport roller or fed from PPC?

(2) Paper misfeeding in the paper feeding section

Error code	Content	Remarks
E14	Lower cassette paper misfeeding (PFU)	Paper does not arrive at the transport roller.

(3) Paper misfeeding in the ADF transport path

Error code	Content	Remarks
E71	Misfeeding in the ADF original feeding section	
E72	Midfeeding in the ADF original transport section	
E73	Misfeeding in the ADF original exiting section	
E75	2 in 1 (2nd-original misfeeding in the feeding section)	

(4) Paper misfeeding in the sorter transport path

Error code	Content	Remarks
E81	Paper delaying jam in the sorter transport path	Paper does not arrive at the entrance sensor.
E82	Paper staying jam in the sorter transport path.	Paper stays at the entrance sensor.

(5) Service call for the copier's drive system

Error code	Content	Remarks
C01	Abnormal operation of the main motor	

(6) Service call for the optical system

Error code	Content	Remarks
C21	Optical system initialization error	Scanning, lens or mirror abnormal operation.
C26	Blown exposure lamp detection	

(7) Service call for the process system

Error code	Content	Remarks
C32	Easy setup (UA mode) error	

(8) Fuser unit related

Error code	Content	Remarks
C41	Abnormal thermistor or broken heater when the power is turned on.	
C43	Abnormal thermistor during warming up or after the copier becomes ready.	
C44	Heater breakage during warming up after the copier becomes ready.	

(9) Communication related service call

Error code	Content	Remarks
C54	Abnormal communication between the sorter and the main CPU	
C55	Abnormal communication between ADF and the main CPU	

(10) ADF related

Error code	Content	Remarks
C71	Locked ADF main motor	ADF jam LED is flashed.
C72	Maladjusted aligning sensor detection	ADF jam LED is flashed.
C73	Faulty EEPROM initialization	ADF jam LED is flashed .

(11) Sorter related service call

Error code	Content	Remarks
C81	Abnormal paper transport motor	
C82	Abnormal bin-moving motor	
C83	Upper limit error	
C84	Lower limit error	
C85	Home sensor error	
C88	Copy-removal sensor error	

(12) Service call for other abnormalities

Error code	Content	Remarks
C94	Faulty optical system initialization in special modes (CH, AJ).	The content is similar to C21 error.

1.2 Self-Diagnostic Mode

Keys pressed simultaneously	Mode	Description	Clearing	Indication
0+1	All control-panel LEDs ON mode	All LEDs on the control panel come on.	“Clear/Stop” key	—
0+2	Aging mode	Aging	“09”	AG
0+3	Test mode	Motor test and input/output check (including initialization)	“09”	CH
0+4	Test mode	Motor test and input/output check	“09”	CH
0+5	Adjustment mode	Various adjustments	“09”	AJ
0+6	Forced ready mode	Forces the copier to become ready.	—	—
0+7	Aging mode	Aging (with ADF)	“09”	AG
0+8	Setting mode	System changing and setting defaults and PM counter	“09”	AD

Note: How to access each mode:

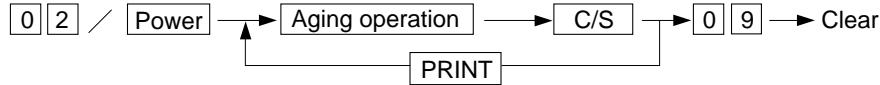
While pressing the two keys for the mode to access (ex. “0” and “5” for the adjustment mode), turn on the main (power) switch.

<Procedure>

- All control-panel LEDs ON mode (01) :



- Aging mode (02) :



- Test mode (03 or 04) :

For this mode, refer to the “Input/Output Check” on page 1-6.

- Adjustment mode (05) :

For this mode, refer to the “Adjustment Mode” on page 1-9.

- Forced ready mode (06) :

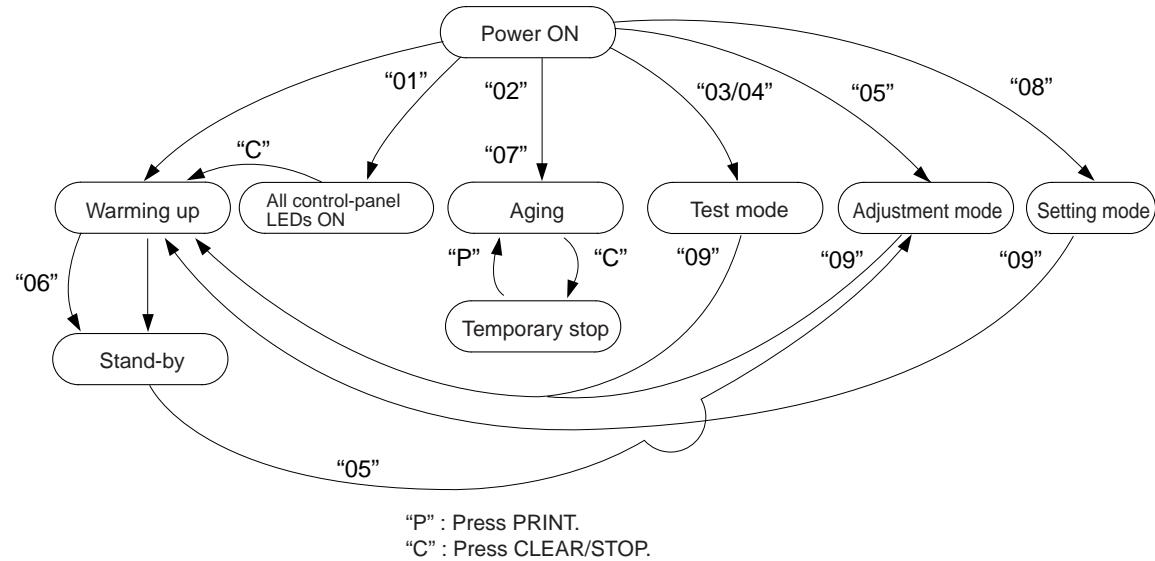
Power → **0 6** → **Forced ready status**

Note: This mode should be used only when checking paper feeding operation.

- Setting mode (08) :

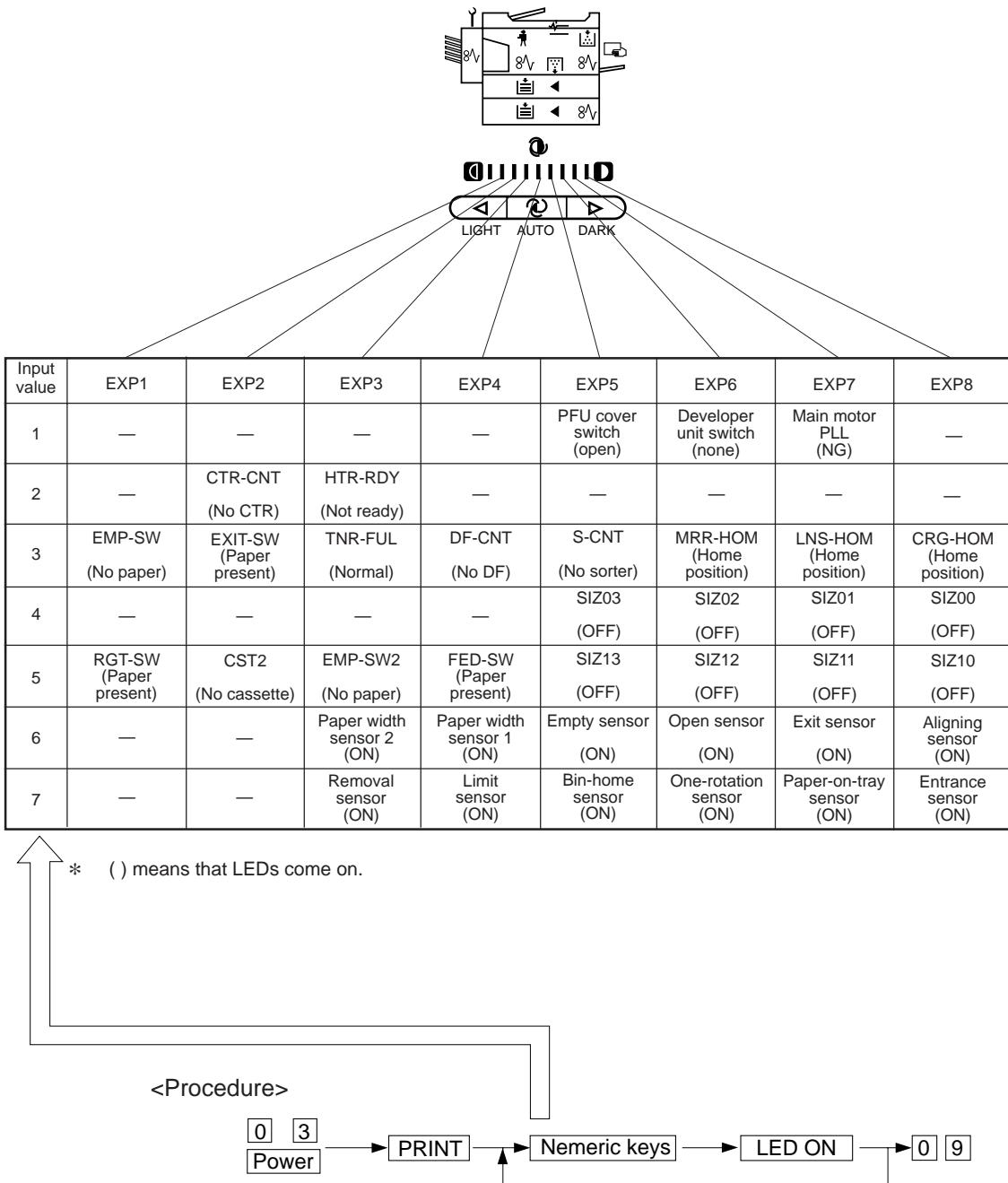
For this mode, refer to "Setting Mode" on page 1-12.

Self-diagnostic mode progress diagram :



1.2.1 Input check (Test mode 03/04)

In the 03 or 04 test mode, you can check the status of each of the following input signals by pressing the corresponding keys.



1.2.2 Output check mode (Test mode 03/04)

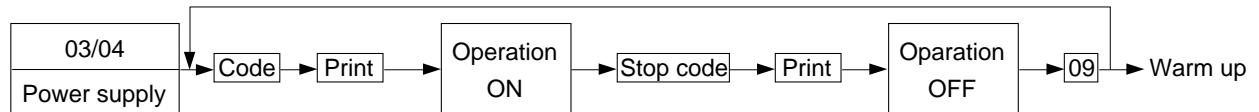
In the 03 or 04 test mode, you can check the status of each of the output signals by entering the following corresponding code.

Code	Function	Code	Function	Group		
1	Main motor	ON	11	Main motor		
2	Feed roller clutch (copier)		12	Feed roller clutch (copier)		
3	Aligning roller clutch (copier)		13	Aligning roller clutch (copier)		
6	Toner motor		16	Toner motor		
7	Optics fan		17	Optics fan		
8	Exit fan		18	Exit fan		
9	Pick-up roller clutch (copier)		19	Pick-up roller clutch (copier)		
10	Total counter	Increases at each "P" key press.				
*1 20	Scanning motor	At 1st "P" key press, scans forward and backward at 2nd press.				
21	Lens motor	At 1st "P" key press, moves to 50% position and to 200% position at 2nd press.				
22	Mirror motor	At 1st "P" key press, moves to 50% position and to 200% position at 2nd press.				
30	HVT-M	At 1st "P" key press, comes on and goes off at 2nd press.		(3)		
31	HVT-TR					
32	HVT-AC					
33	Exposure lamp	If forced on for 5 sec., it goes off.				
61	PFU motor (PFU)	ON	71	PFU motor (PFU)		
62	Pick-up roller clutch (PFU)		72	Pick-up roller clutch (PFU)		
63	Feed roller clutch (PFU)		73	Feed roller clutch (PFU)		
64	Aligning roller clutch (PFU)		74	Aligning roller clutch (PFU)		
80	DF independent aging	At 1st "P" key press, starts and stops at 2nd press.				
82	DF pick-up roller rotation	At 1st "P" key press, comes on and stops at 2nd press.		(3)		
83	DF aligning roller					
84	DF transport belt rotation					
85	DF pick-up roller rotation/Weight solenoid					
86	DF weight solenoid					
87	DF clutch					
90	Sorter transport motor					
91	Sorter bin motor					
92	Sorter aging without paper	At 1st "P" key press, starts and goes off at 2nd press.				

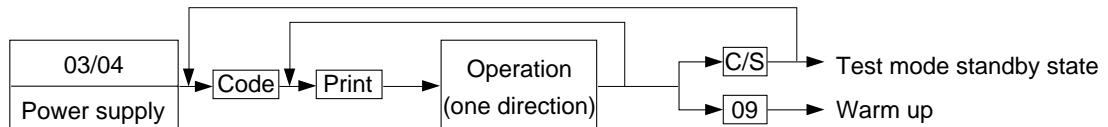
*1: Scanning motor rotates at the preset reproduction ratio.

<Operation procedure>

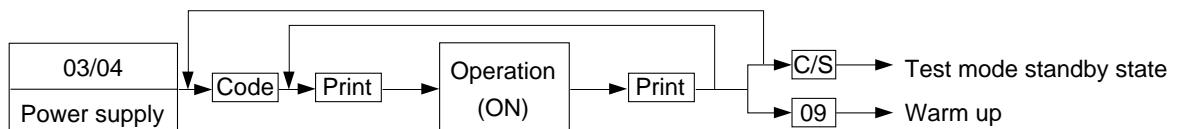
Group 1



Group 2



Group 3



1.2.3 Adjustment mode (AJ: 05)

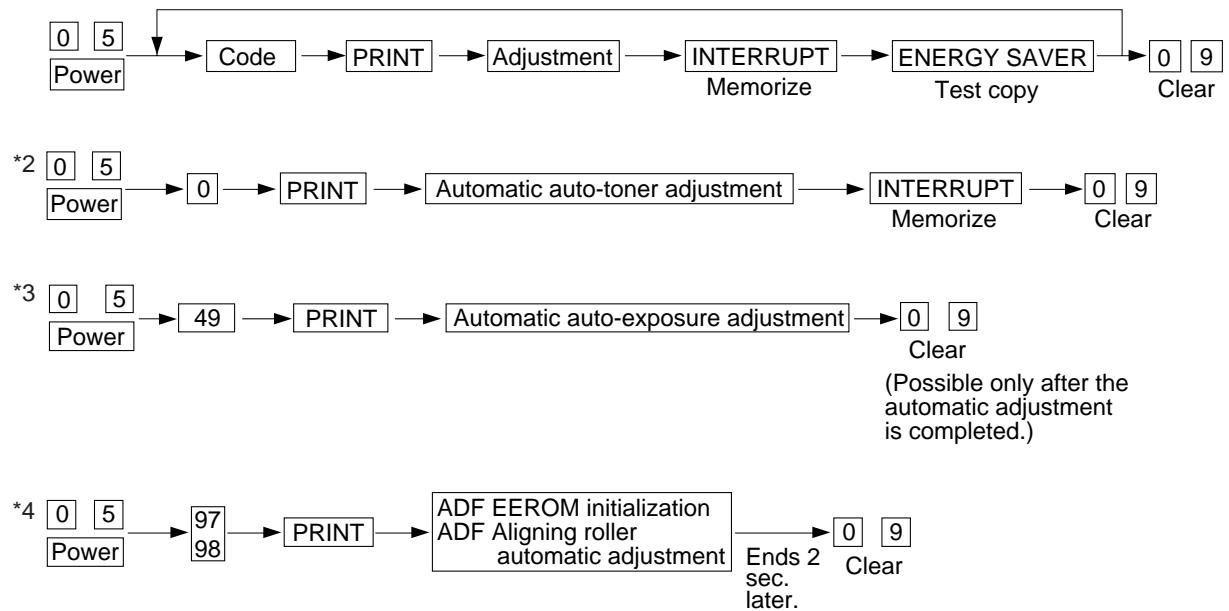
In this adjustment mode, the following items can be adjusted or modified. (Refer to the adjustment code list.) The adjustment mode can be accessed by turning on the power while pressing the "0" and "5" keys simultaneously.

Code	Description		Allowable input value	Initial value *1	Content
*20	Automatic auto-toner adjustment		—	—	Set to 24.
1	Manual exposure	100%	0~255	128	The larger, the lighter.
2	Manual exposure	154%	0~255	128	The larger, the lighter.
3	Manual exposure	50%	0~255	128	The larger, the lighter.
4	Manual exposure	200%	0~255	128	The larger, the lighter.
5	Auto-exposure	100%	0~255	128	The larger, the lighter.
6	Auto-exposure	154%	0~255	128	The larger, the lighter.
7	Auto-exposure	50%	0~255	128	The larger, the lighter.
8	Auto-exposure	200%	0~255	128	The larger, the lighter.
9	Exposure (light) Inclination		0~255	255	The larger, the lighter at the light side.
10	Exposure (dark) Inclination		0~255	0	The larger, the lighter at the dark side.
14	Photo exposure	100%	0~255	128	The larger, the lighter.
15	Photo exposure	154%	0~255	128	The larger, the lighter.
16	Photo exposure	50%	0~255	128	The larger, the lighter.
17	Photo exposure	200%	0~255	128	The larger, the lighter.
21	Lengthwise reproduction ratio adjustment		0~15	8	Each increase by "1" causes the lengthwise reproduction ratio to increase by 0.1%
25	Eraser LED timing adjustment	100%	0~15	8	Each increase by "1" causes the erased position by LED to shift approx. 1mm toward the trailing edge of the paper. But the image position relative to the paper does not change. (with original surface as reference)
26	Eraser LED timing adjustment	200%			
27	Eraser LED timing adjustment	50%			

Code	Description	Allowable input value	Initial value *1	Content
30	Eraser LED leading edge margin adjustment	0~15	8	Each increase by "1" causes the erased position by LED to shift 1mm toward the trailing edge. (with paper surface as reference)
31	Eraser LED trailing edge margin adjustment			
35	Margin on the leading edge	0~15	0	0: No margin 1~15: Margin present (approx. 1mm/step)
36	Margin on the trailing edge			
38	Grid bias adjustment	0~255	128	The larger, the larger output.
39	Transfer transformer adjustment	0~255	128	The larger, the larger output.
40	Separation transformer adjustment	0~255	128	The larger, the larger output.
42	Grid bias adjustment (photo)	0~255	121	The value should be 121.
*349	Automatic auto-exposure adjustment	—	—	
53	Leading edge (copier; 100%)	0~15	8	Each increase by "1" causes the image to shift 0.80mm toward the paper leading edge.
54	Leading edge (copier; 200%)			
55	Leading edge (copier; 50%)			
56	Leading edge (bypass feeding)			
57	Leading edge position (PFU)			
60	Lens position adjustment (100%)	0~40	20	Each increase by "1" moves toward the exit side.
61	Mirror position adjustment (100%)			
62	Enlargement correction (200%)			
63	Enlargement error ratio (200%)			
64	Reduction correction (50%)			
65	Reduction error ratio (50%)			
80	Aligning amount (PFU)	0~15	8	Each increase by "1" causes the paper to bow more.
82	Aligning amount (copier)			
84	ADF aligning amount	0~15	8	Each decrease by "1" causes the original stop position to shift about 1mm toward the original scale.
87	ADF original-to-original gap (2 in 1 mode)	0~15	8	Each increase by "1" causes the gap between the originals to increase about 1mm.
90	Auto-toner adjustment	0~255	128	Shows the adjustment value of the auto toner sensor.
*4 97	ADF EEPROM initialization	—	—	
*4 98	ADF aligning sensor automatic adjustment	—	—	

*1: The initial value signifies the value set by the NV-RAM initialization program and not the value set at the time of shipping from the factory.

<Procedure>



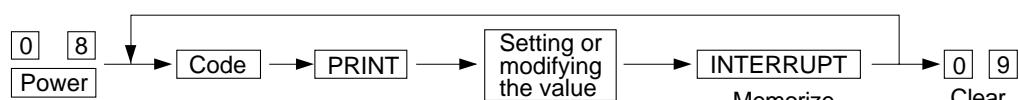
1.2.4 Setting mode (08)

In this mode, it is possible to set or modify the various modes shown in the following setting code list.

Code	Description	Allowable input value	Initial value	Content
2	Size indication by the carriage	0, 1	1	0: None; 1: Available
4	Automatic sort mode	0~3	0	0: None; 1, 2: Sort; 3: Group
7	Access control mode	0, 1	0	0: None; 1: Available
8	Version	0~2	Each version	0: EUR; 1: UC; 2: JPN
9	ACT selection (reproduction ratio in the direction of copy movement)	0, 1	0: EUR 1: UC	0: 100%; 1: 101%
10	Timer mode (auto reset)	0~10	3 (45 sec.)	0: None; 1: 15 sec. 2: 30sec.; 3: 45 sec. 4: 60 sec.; N: N × 15 sec.
11	Auto power saving	0~15	0	0: None; 1: 30 sec. 2: 60 sec.; 3: 90 sec. 4: 120 sec.; 5: 150 sec. 6: 3 min.; 7: 4 min. 8: 5 min.; 9: 7 min. 10: 10 min.; 11: 15 min. 12: 20 min.; 13: 30 min. 14: 45 min.; 15: 60 min.
12	Maximum number of copies	0~3	0	0: Max. 999 copies 1: Max. 99; 2: Max. 9 3: Max. 500
13	Paper feeding retry	0,1	0	0: Retry; 1: No retry
14	Cassette priority selection	0~4	0	0: A4/LT 3: Copier; 4: PFU
15	Exposure priority selection	0~2	0	0: Auto; 1: Manual 3: Photo mode
16	A3-size double counting	0,1	0	0: Single count; 1: Double count
17	Bypass auto start	0,1	0	0: Manual start; 1: Auto start
19	Sorter priority selection	0~3	0	0: Non-sort; 1, 2: Sort; 3: Group
20	Pre-run ON/OFF	0~15	0	0: OFF 1~15: N × 10 sec.

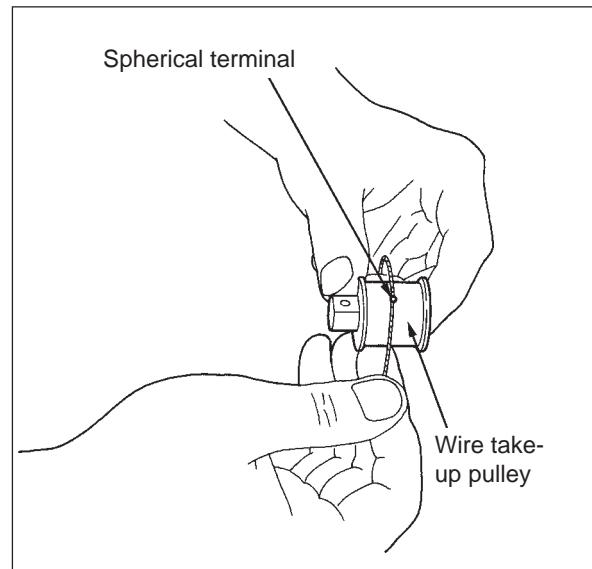
Code	Description	Allowable input value	Initial value	Content	
21	Auto cassette change	0,1	1	0: None; 1: Available	
22	ADF mode	0~5	0	0: Manual; 1: APS 2: AMS; 3: 2 in 1+AMS 4: 2 in 1+APS 5: 2 in	
23	Thick paper selection at bypass pre-running	0,1	0	0: None; 1: Available	
27	ADF's APS mode	0~2	0: UC 1: EUR	0: Detection for each original; 1: Detection for 1st original only; 2: Prevents copying blank originals	
28	Pressing PRINT after suspension of APS/AMS	0~2	0	0: 1st copying possible 1: 2nd Copying possible 2: Copying not possible	
37	Default sorter key selection	0,1	0	0: Normal; 1: Sort default	
38	Heater temperature during power saving	0~7	0	0: Heater off; 1: 120°C 2: 130°C; 3: 140°C 4: 150°C; 5: 160°C 6: 170°C; 7: 180°C	
44	All clearing after copying	0,1	0	0: None; 1: Available	
51	Easy set-up method (UA mode)	0,1	0	0: No; 1: Yes	
52	Quick copy mode	0,1	0: EUR 1: UC	0: None; 1: Available	
53	Broken exposure lamp detection	0~2	0	0: All exposure modes 1: Auto only; 2: None	
54	Coin-vender mode	0,1	0	0: None; 1: Available	
58	Reproduction-ratio display time	0~15	0	2+0.2×N sec.	
59	LG size	0,1	0	0: 14 inch; 1: 13 inch	
62	AMS copy stop switching	0,1	0	0: No stop; 1: Temporary stop	
63	DF key selection order switching	0,1	0: EUR 1: UC	0: APS → AMS → 2in1 + AMS → 2in1 + APS → 2in1 0: APS → AMS → 2in1 + AMS	
69	PM counter setting	0~999,999	0	0: No PM counter; Other than 0: When set value ≤ code 79, PM call occurs.	
79	Current PM counter value	0~999,999	0		
89	Heater abnormal counter	0~7	0	Heat roller thermistor breakage counter: 0~1: Copying possible; 2~7: Copying not possible	

<Procedure>

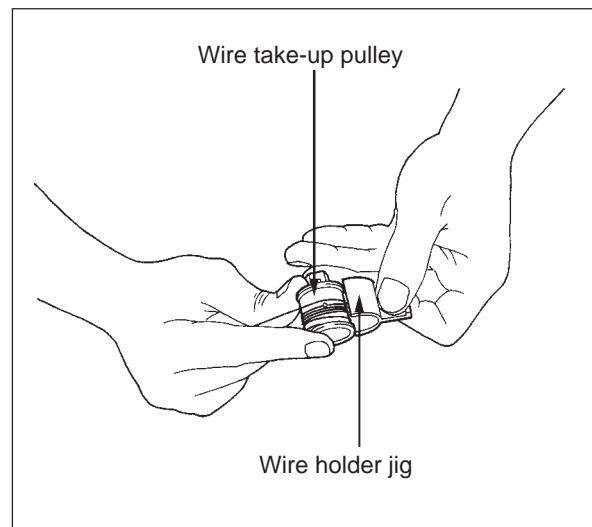


1.3.A Installing the Carriage Drive Wire

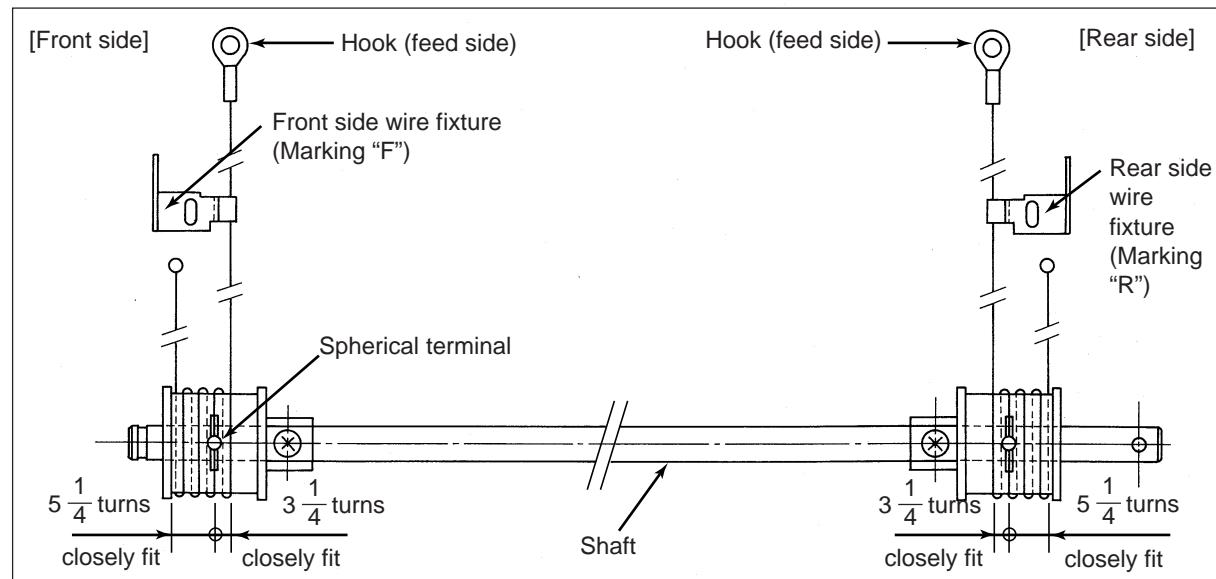
(1) Set the wire so that its spherical terminal is placed in the hole of the wire take-up pulley.



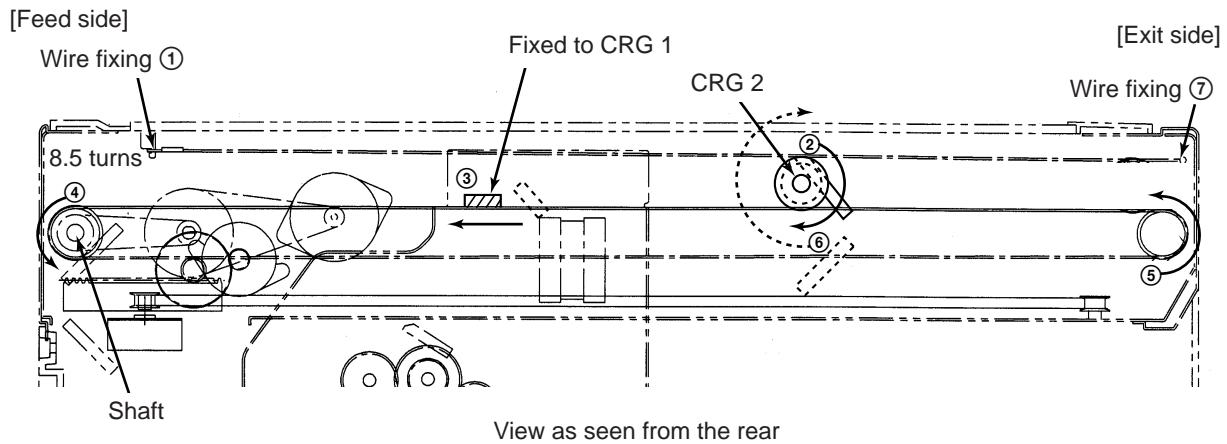
(2) Using the wire holder jig, wrap the wire on the take-up pulley, 3-1/4 turns of the fixture-side end and 5-1/4 turns of the other end.



(3) Wrap the wires on the front and rear sides, as shown and fasten them with screws.



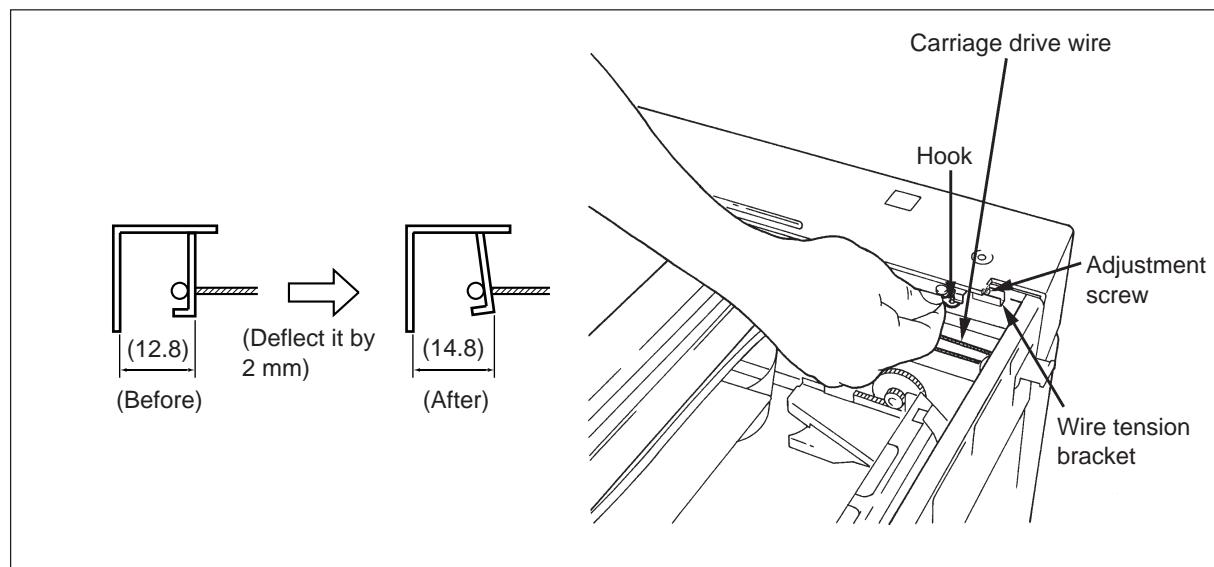
- (4) Install carriage 2.
- (5) As shown on figure , attach the wires.



1.3.B Adjusting the Carriage Wire Tension

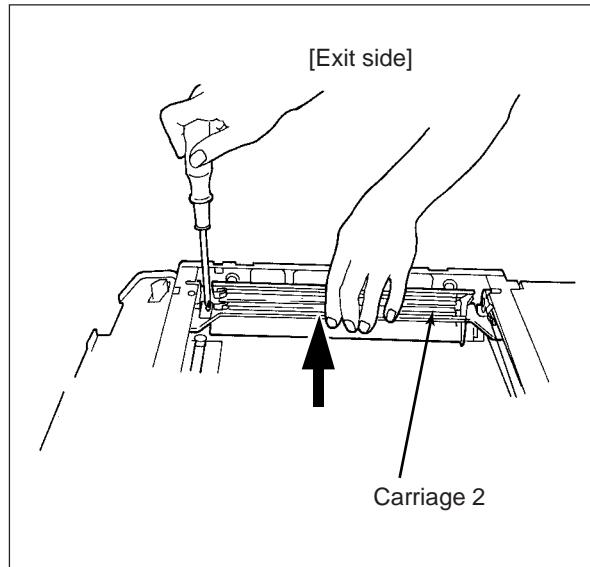
After having removed the wire, adjust the tension of the wire with the adjustment screw so that the exit side leaf spring will be deflected as shown in the drawing below.

Also, always adjust the positions of the carriage 1 and 2 after finishing the tension adjustment.



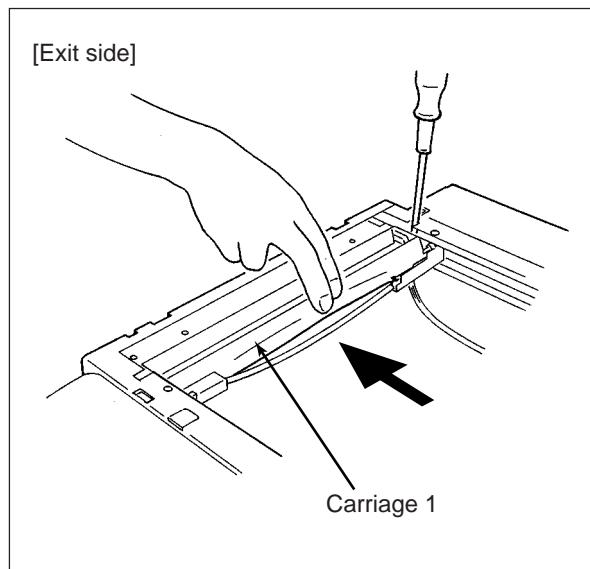
1.4 Position Adjustment of Carriage 1 and 2

- (1) While pushing carriage 2 to exit side, tighten the screw on the front.



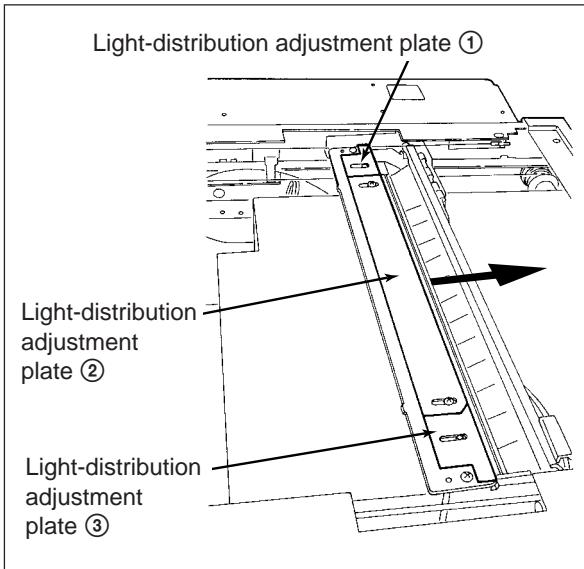
- (2) Fasten carriage 1 to the wire: Each screw on the front and rear should be tightened temporarily.
- (3) While pushing carriage 1 to the exit side (carriage 2), tighten the screws
..... on the front and rear.

Note: Move carriages 1 and 2 to the exit side by rotating the shaft and check to make sure that the claws of both carriages (two for each) touch the inside surface of the frame at the same time.

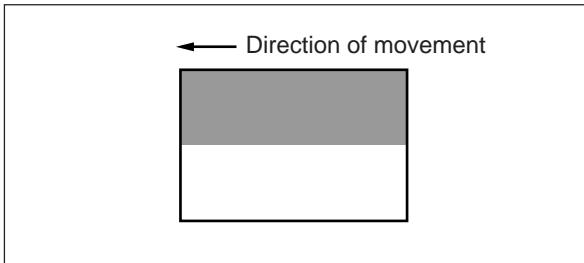


1.5 Light Distribution Adjustment

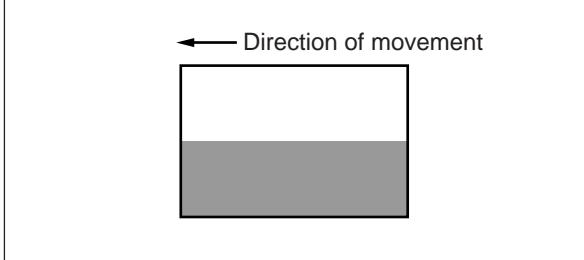
- (1) Remove the glass holder (2 screws) and then the original glass.
- (2) Move light-distribution adjustment plate ① - ③ in the direction of the arrow (←), depending on the amount of uneven light distribution. Adjustment should be made so that the image becomes darker evenly.



- (3) Move light-distribution adjustment plates ① and ② in the direction of the arrow.
(When the rear side is darker)



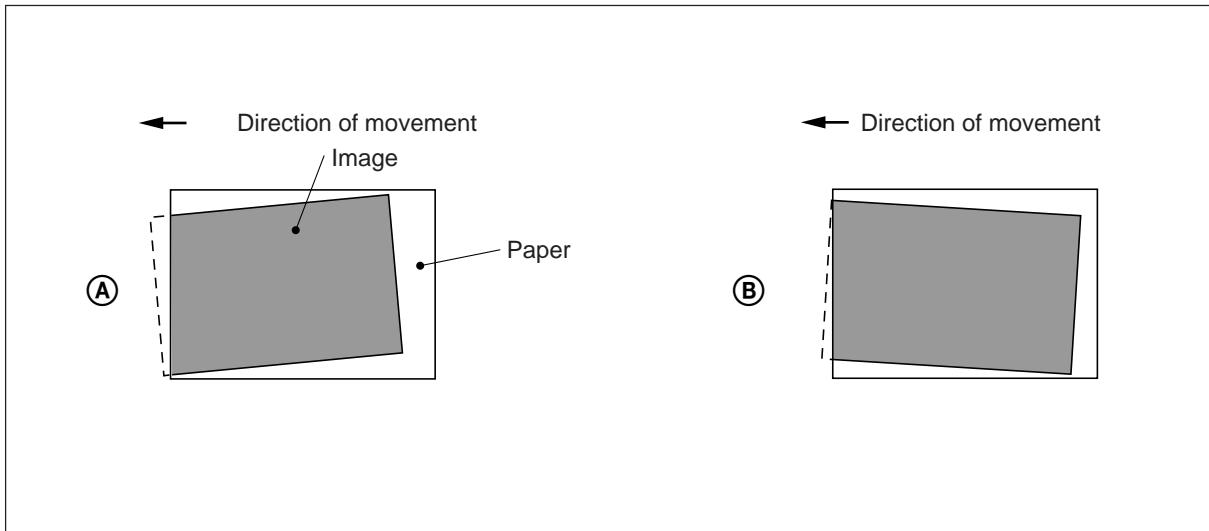
- (4) Move light-distribution adjustment plates ② and ③ in the direction of the arrow.
(When the front side is darker)



As a result of the above adjustment, there is a possibility that under-exposure or over-exposure may occur; make exposure adjustment if necessary.

1.6 Image Slanting and Image Distortion Adjustment

(1) Image slanting adjustment



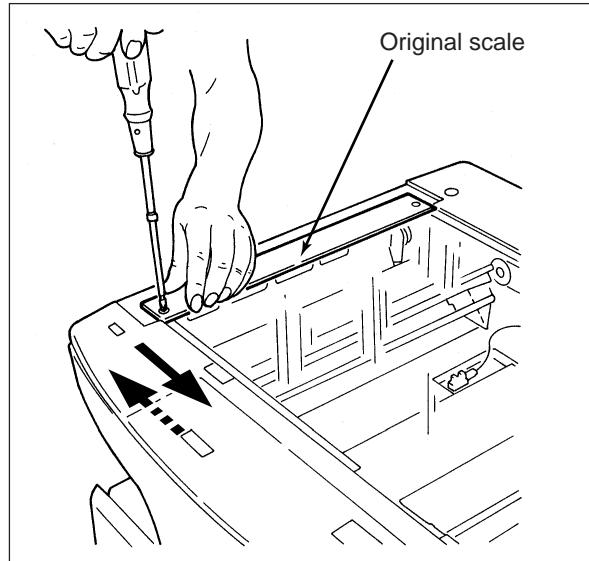
After making a copy with the original aligned correctly with the original scale, if the copy image is slanting, adjustment should be made by moving the front side of the original scale.

Slanting as in (A):

Adjust the original scale in the direction of the arrow (→).

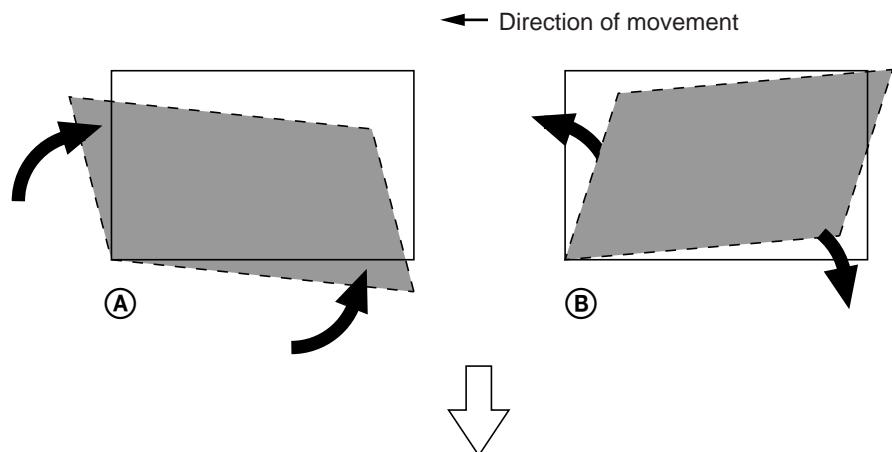
Slanting as in (B):

Adjust the original scale in the direction of the arrow (→→).

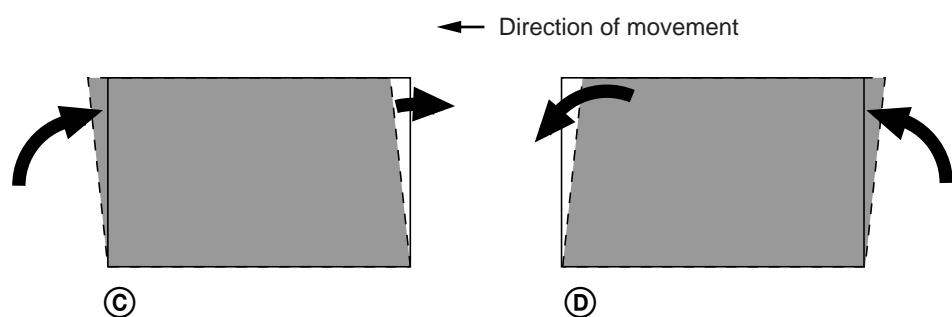


(2) Image distortion adjustment

Step 1



Step 2



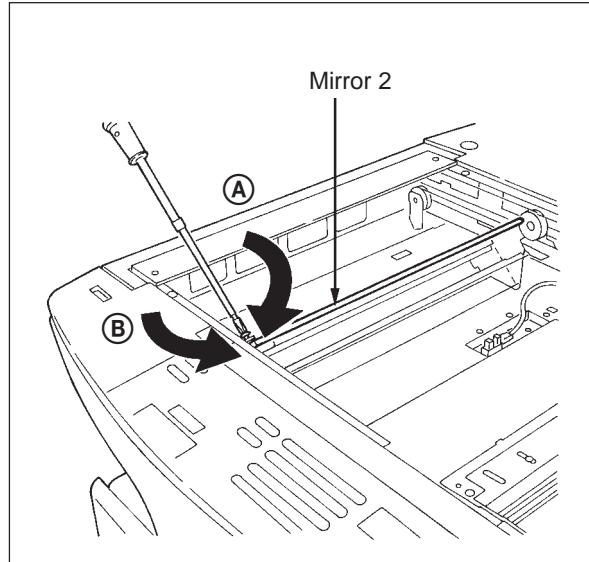
<Adjustment procedure>

After removing the original glass, make adjustment using the following procedure:

Step 1: If the image is distorted as in (A) or (B), make adjustment in the direction of copy movement using the mirror 2's adjustment screw to make the image as in (C) or (D):

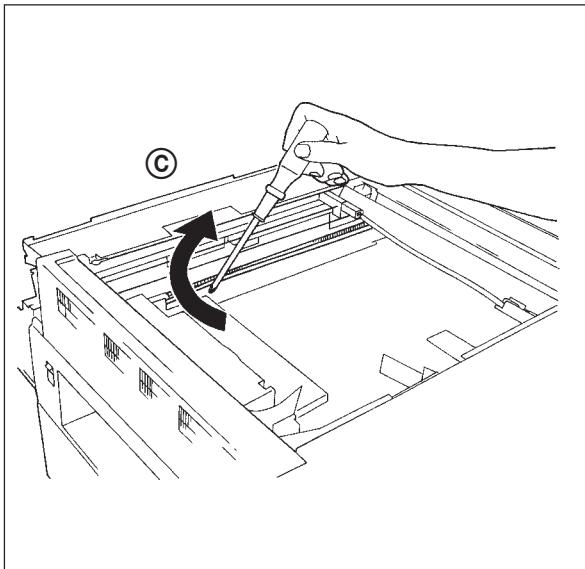
In the case of (A): Rotate the adjustment screw in the direction of tightening (clockwise).

In the case of (B): Rotate the adjustment screw in the direction of loosening (counter-clockwise).

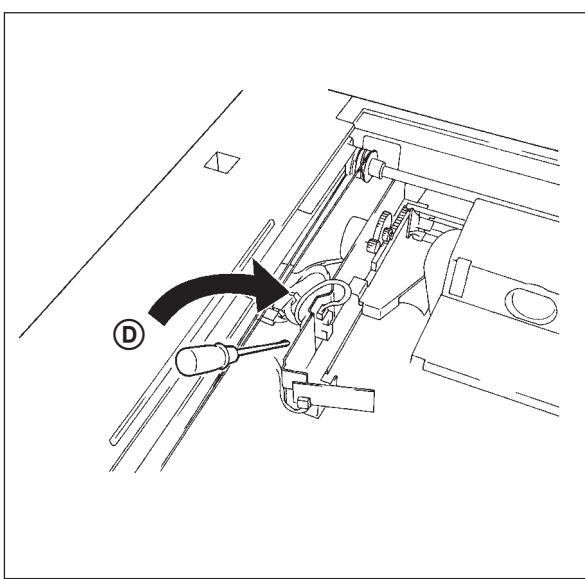


Step 2: If the image is distorted as in ④ or ⑤, using the mirror 6's adjustment screw, make adjustment in the direction perpendicular to that of copy movement to make the image normal:

In the case of ④: Rotate the front side screw in the direction tightening (clockwise).

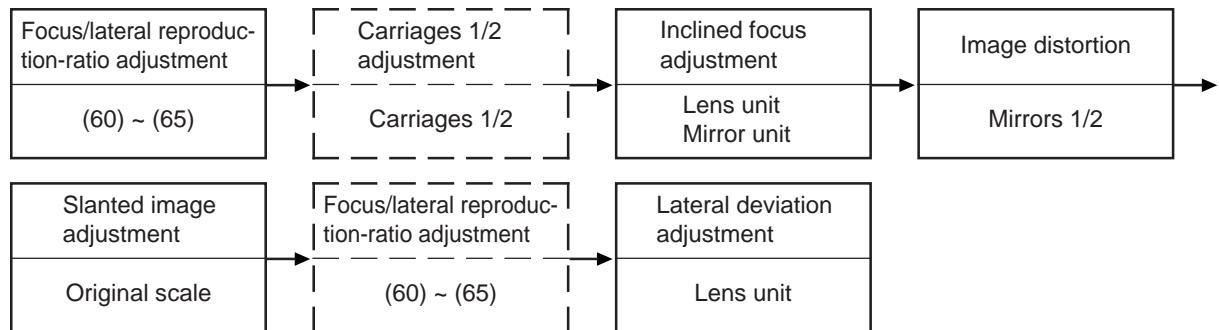


In the case of ⑤: Rotate the rear side screw in the direction tightening (clockwise).



1.7 Mirror and Lens Adjustment

Checking and adjustment regarding the mirrors and the lens should be made by using the following procedure:



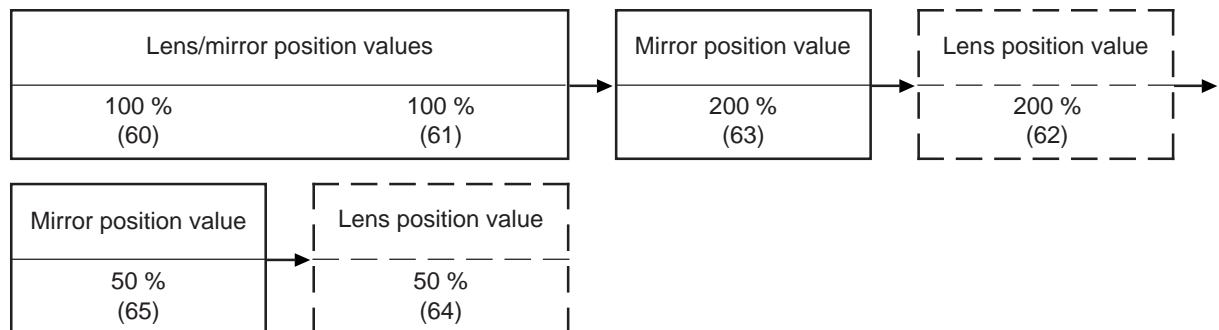
Note: Do adjustment steps in the dotted-line boxes, as required.

Focus/lateral reproduction-ratio adjustment AJ: Codes 60 - 65

When the lens is replaced or when the focus or the lateral reproduction ratio is not correct, the following adjustment data need to be re-entered:

		Allowable input value	Center value
Lens position data (100%)	(AJ"05" mode, code 60)	0~40	20
Mirror position data (100%)	(AJ"05" mode, code 61)	0~40	20
Lens position data (200%)	(AJ"05" mode, code 62)	0~40	20
Mirror position data (200%)	(AJ"05" mode, code 63)	0~40	20
Lens position data (50%)	(AJ"05" mode, code 64)	0~40	20
Mirror position data (50%)	(AJ"05" mode, code 65)	0~40	20

Adjustment should be done as follows:



Normally, adjustment steps in the dotted-line boxes are unnecessary.

[A] 100% focus and lateral reproduction-ratio adjustment

- (1) Make an actual-sized copy and check for the correct focus and lateral reproduction ratio; if adjustment is necessary, re-enter adjustment data as described below:
 - ① If the focus is inadequate and lateral reproduction ratio is smaller:
Enter a smaller mirror-position value (code 61).

- ⑥ If the focus is inadequate and the lateral reproduction ratio is enlarged:
Enter a larger mirror-position value (code 61).
- ⑦ If the focus is adequate but the lateral reproduction ratio is reduced:
Enter a larger lens-position value (code 60).
- ⑧ If the focus is adequate but the lateral reproduction ratio is increased:
Enter a smaller lens-position value (code 60).

Notes:

- 1. Moving either the lens or the mirror changes both the focus and the lateral reproduction ratio.
However, the lens-position value mainly changes the lateral reproduction ratio and the mirror position value mainly changes the focus.
- 2. First adjust the focus, then the lateral reproduction ratio and check the focus again.
- 3. If the lateral reproduction ratio is not precisely adjusted (within $\pm 0.5\%$), the focus cannot be correctly adjusted either.
- 4. The focus in the center of the image has more margin than that of any of the four corners of the image due to the characteristics of the lens.
- 5. For 200% and 50% reproduction ratios, adjustment of the normal focus (mirror position) makes the lateral reproduction ratio optimal, making it unnecessary to be adjusted.

[B] 200% focus and lateral reproduction-ratio adjustment

- (1) Make a 200% copy and check for the correct focus and lateral reproduction ratio.
- (2) When the focus and the lateral reproduction ratio are inadequate, re-enter the values of codes 62 and 63 in the AJ "05" mode in the same way as for 100%.

[C] 50% focus and lateral reproduction ratio adjustment

- (1) Make a 50% copy and check for the correct focus and lateral reproduction ratio.
- (2) When the focus and the lateral reproduction ratio are inadequate, re-enter the values of codes 64 and 65 in the AJ "05" mode in the same way as for 100 %.

1.8 Adjustment of Lateral Misplacement of the Lens Unit

The lens unit and the mirror unit (mirrors 4 and 5) have each adjustable mechanism.

However, as the adjustment is performed at the time of shipping from the factory, no further adjustment is needed.

1.9 Exposure Adjustment

- (1) While pressing keys "0" and '5" simultaneously, turn the power supply ON. The display shows "AJ" and indicates that the machine is in adjustment mode.
- (2) Press the automatic exposure key to set the machine to manual exposure, and then select the center step.
- (3) Adjust the exposure in accordance with the procedure shown in the chart below.

Adjustment sequence	Exposure mode	Reproduction ratio	Adjustment code
1	Manual exposure	100%	1
2	Automatic adjustment of automatic exposure	50 ~ 200%	49
*3	Light (max.)	100% or appropriate reproduction ratio	9
*4	Dark (min.)		10
5	Manual photo exposure	100%	14

* Make adjustment only when requested by the user.

When individual adjustment is required for manual, automatic and manual photo exposure in response to a request from the user, follow procedure (4).

① Adjustment of 100% manual exposure

Sequence	Operation	Display after operation (typical)
1-1	Input code "1" using the digital keys , and press the "Print" key.	120
1-2	[When density is high] Increase the numerical value, using the "Zoom" key. (Note 2) [When density is low] Reduce the numerical value, using the "Zoom" key. (Note 2)	129 (Note 1) Zone A 180
1-3	Press the "Interrupt" key and enter the numerical value in the memory.	AJ
1-4	Press the "Energy saver" key and make a test copy (one)	
1-5	If the image of the test copy is not satisfactory, repeat operations 1-1 through 1-4.	

Note

1. Zone A: When the "Zoom" key is pressed, it increases (or decreases) in increments of one.
2. The numerical value in Zone A can be changed by using the digital keys as well as the "Zoom" key.
3. As adjustment of 154%, 50% and 200% manual exposure has already been performed, readjustment is not required. However, if individual adjustment is requested by the user, conduct the relevant adjustment in accordance with procedure (4), described later.

② Automatic adjustment of automatic exposure

Sequence	Operation	Display after operation (typical)
2-0	Be sure to adjust manual exposure (100%) beforehand. (Note1)	Refer to ①
2-1	Place the adjustment chart on the original glass. (Note 2)	AJ
2-2	Enter code 49 using the digital keys and then press the Print key. * During automatic adjustment, the carriage will shift and the lens and mirror will move in accordance with the reproduction ratio. The exposure lamp will flash four times. * End of automatic adjustment is indicated by return of the display to test mode.	169 ↓ 199 AJ

Note

1. As automatic adjustment of automatic exposure is performed on the basis of manual exposure, be sure to conduct manual exposure beforehand.
2. Use white Ledger or A3 copy paper as the test chart.
3. When adjustment must be performed in accordance with the user's request, perform by referring to (4), to be described later.
4. Avoid opening the original cover, pressing keys on the control panel or turning the power OFF, during automatic adjustment.

When changing the variable width of the key for manual exposure in accordance with the user's request, carry out ③ and ④, described below.

③ Changing the amount of variation in the light image density

Sequence	Operation
3-1	Input code "9" using the digital keys and press the "Print" key.
3-2	Use the "Zoom" key to increase the value to lighten the image (and vice versa).
3-3	Press the "Interrupt" key to store the value.
3-4	Press the "Energy saver" key and make a test copy.
3-5	If the image density of the test copy is not satisfactory, repeat operations 3-1 through 3-4.

④ Changing the amount of variation in the dark image density.

Sequence	Operation
4-1	Input code "10" using the digital keys and press the "Print" key.
4-2	Use the "Zoom" key to increase the value to darken the image (and vice versa).
4-3	Press the "Interrupt" key to store the value.
4-4	Press the "Energy saver" key and make a test copy.
4-5	If the image density of the test copy is not satisfactory, repeat operations 4-1 through 4-4.

⑤ 100% manual photo exposure adjustment

Sequence	Operation	Display after operation (typical)
5-1	Input code "14" using the digital keys, and press the "Print" key.	128
5-2	[When density is high] Increase the numerical value, using the "Zoom" key. [When density is low] Decrease the numerical value, using the "Zoom" key.	138 118
5-3	Press the "Interrupt" key and store the numerical value in the memory.	AJ
5-4	Press the "Energy saver" key and make a test copy.	
5-5	If the image density of the test copy is not satisfactory, repeat operations 5-1 through 5-4.	

(4) Adjust exposure in accordance with the procedures shown in the charts below, if requested by the user for separate adjustment of manual/auto-exposure.

Adjustment sequence	Exposure mode	Reproduction ratio	Adjustment code
1	Manual exposure center	100%	1
2		154%	2
3		50%	3
4		200%	4
5	Automatic exposure	100%	5
6		154%	6
7		50%	7
8		100%	8
9	Light (max.)	100 % or appropriate ratio	9
10	Dark (min.)		10
11	Manual photo exposure	100%	14
12		154%	15
13		50%	16
14		200%	17

① Perform the 100% manual exposure adjustment (3)- ①.

② 154% manual exposure adjustment

Sequence	Operation	Display after operation (typical)
2-1	Input code "2" using the digital keys, and press the "Print" key.	130
2-2	[When density is high] Increase the numerical value, using the "Zoom" key. [When density is low] Decrease the numerical value, using the "Zoom" key.	149 126
2-3	Press the "Interrupt" key and store the numerical value in the memory.	AJ
2-4	Press the "Energy saver" key and make a test copy.	
2-5	If the image density of the test copy is not satisfactory, repeat operations 2-1 through 2-4.	

③ 50% manual exposure adjustment

Sequence	Operation	Display after operation (typical)
3-1	Input code "3" using the digital keys, and press the "Print" key.	103
3-2	[When density is high] Increase the numerical value, using the "Zoom" key. [When density is low] Decrease the numerical value, using the "Zoom" key.	109 096
3-3	Press the "Interrupt" key and store the numerical value in the memory.	AJ
3-4	Press the "Energy saver" key and make a test copy.	
3-5	If the image density of the test copy is not satisfactory, repeat operations 3-1 through 3-4.	

④ 200% manual exposure adjustment

Sequence	Operation	Display after operation (typical)
4-1	Input code "4" using the digital keys, and press the "Print" key.	175
4-2	[When density is high] Increase the numerical value, using the "Zoom" key. [When density is low] Decrease the numerical value, using the "Zoom" key.	186 166
4-3	Press the "Interrupt" key and store the numerical value in the memory.	AJ
4-4	Press the "Energy saver" key and make a test copy.	
4-5	If the image density of the test copy is not satisfactory, repeat operations 4-1 through 4-4.	

⑤ 100% automatic exposure adjustment

Sequence	Operation	Display after operation (typical)
5-1	Input code "5" using the digital keys, and press the "Print" key.	115
5-2	[When density is high] Increase the numerical value, using the "Zoom" key. [When density is low] Decrease the numerical value, using the "Zoom" key.	127 107
5-3	Press the "Interrupt" key and store the numerical value in the memory.	AJ
5-4	Press the "Energy saver" key and make a test copy.	
5-5	If the image density of the test copy is not satisfactory, repeat operations 5-1 through 5-4.	

⑥ 154% automatic exposure adjustment

Sequence	Operation	Display after operation (typical)
6-1	Input code "6" using the digital keys, and press the "Print" key.	127
6-2	[When density is high] Increase the numerical value, using the "Zoom" key. [When density is low] Decrease the numerical value, using the "Zoom" key.	139 113
6-3	Press the "Interrupt" key and store the numerical value in the memory.	AJ
6-4	Press the "Energy saver" key and make a test copy.	
6-5	If the image density of the test copy is not satisfactory, repeat operations 6-1 through 6-4.	

⑦ 50% automatic exposure adjustment

Sequence	Operation	Display after operation (typical)
7-1	Input code "7" using the digital keys, and press the "Print" key.	094
7-2	[When density is high] Increase the numerical value, using the "Zoom" key. [When density is low] Decrease the numerical value, using the "Zoom" key.	087 103
7-3	Press the "Interrupt" key and store the numerical value in the memory.	AJ
7-4	Press the "Energy saver" key and make a test copy.	
7-5	If the image density of the test copy is not satisfactory, repeat operations 7-1 through 7-4.	

⑧ 200% automatic exposure adjustment

Sequence	Operation	Display after operation (typical)
8-1	Input code "8" using the digital keys, and press the "Print" key.	141
8-2	[When density is high] Increase the numerical value, using the "Zoom" key. [When density is low] Decrease the numerical value, using the "Zoom" key.	149 133
8-3	Press the "Interrupt" key and store the numerical value in the memory.	AJ
8-4	Press the "Energy saver" key and make a test copy.	
8-5	If the image density of the test copy is not satisfactory, repeat operations 8-1 through 8-4.	

⑨ When changing the variable width of the key for manual exposure at the user's request, change the amount of variation in the light/dark image density in (3)- ③ and ④.

⑩ Perform the 100% manual photo exposure adjustment in (3)- ⑤.

⑪ 154% manual photo exposure adjustment

Sequence	Operation	Display after operation (typical)
11-1	Input code "15" using the digital keys, and press the "Print" key.	128
11-2	[When density is high] Increase the numerical value, using the "Zoom" key. [When density is low] Decrease the numerical value, using the "Zoom" key.	138 118
11-3	Press the "Interrupt" key and store the numerical value in the memory.	AJ
11-4	Press the "Energy saver" key and make a test copy.	
11-5	If the image density of the test copy is not satisfactory, repeat operations 11-1 through 11-4.	

⑫ 50% manual photo exposure adjustment

Sequence	Operation	Display after operation (typical)
12-1	Input code "16" using the digital keys, and press the "Print" key.	128
12-2	[When density is high] Increase the numerical value, using the "Zoom" key. [When density is low] Decrease the numerical value, using the "Zoom" key.	138 118
12-3	Press the "Interrupt" key and store the numerical value in the memory.	AJ
12-4	Press the "Energy saver" key and make a test copy.	
12-5	If the image density of the test copy is not satisfactory, repeat operations 12-1 through 12-4.	

⑬ 200% manual photo exposure adjustment

Sequence	Operation	Display after operation (typical)
13-1	Input code "17" using the digital keys, and press the "Print" key.	128
13-2	[When density is high] Increase the numerical value, using the "Zoom" key. [When density is low] Decrease the numerical value, using the "Zoom" key.	138 118
13-3	Press the "Interrupt" key and store the numerical value in the memory.	AJ
13-4	Press the "Energy saver" key and make a test copy.	
13-5	If the image density of the test copy is not satisfactory, repeat operations 13-1 through 13-4.	

1.10 Checking and Adjustment of Grid Bias/Transfer/Separation Output

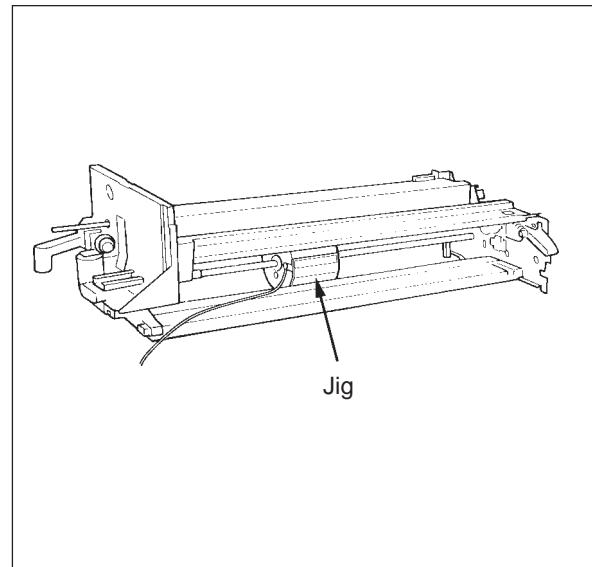
Checking and adjustment of grid bias/transfer/separation output is necessary when the high-voltage transformer is replaced.

At adjustment mode "05" { "38" grid bias (Black)
 "39" transfer charger
 "40" separation charger

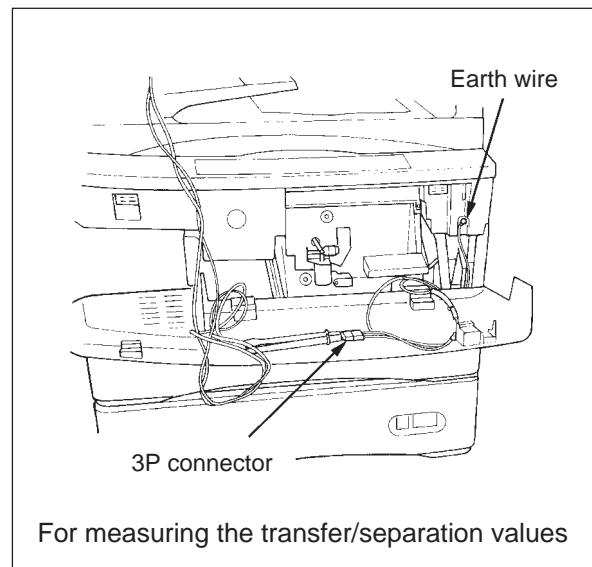
Notes: 1. A digital tester with an input resistance of 10 MΩ or more should be used.

<Adjustment procedure>

1. Take out the process unit, and then remove the developer unit, main charger unit and drum.
2. Remove the main blade.
3. Using the drum shaft, install the adjustment jig in the cleaner unit and then set the main charger unit.



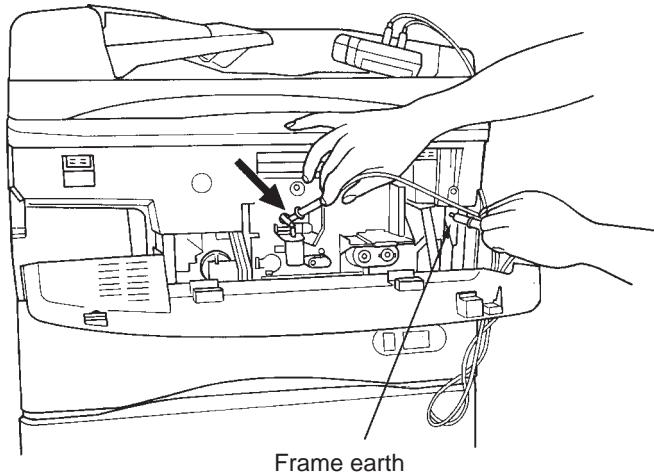
4. Set the process unit into the copier and fasten the earth wire of the jig to the machine frame with a screw. Then connect the black (WH) side of the jig's 3P-connector to the (–) terminal and the red (WH) side to the (+) terminal of the digital tester, respectively.
5. Push down the upper unit. (Be careful not to allow the jig's cord to be pinched).



For measuring the transfer/separation values

6. Turn on the door switch forcefully.

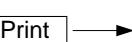
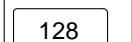
Note: When measuring the grid bias*, route the (+) terminal of the digital tester through the charger cleaning shaft gap on the front side of the process unit and contact the charger plate spring with the (+) terminal.



7. Setting of digital tester

- In the case of grid bias: Set at 1000 VDC range
- In the case of transfer: Set at 2 VDC range
- In the case of separation: Set at 2 VAC range

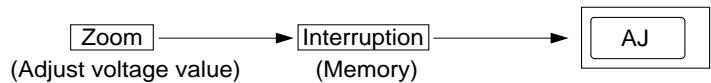
8.  → 

9.  →  → 
(38,39,40 or 42)

10. Check voltage value using digital tester

- *Grid bias: -692 ± 5 V (Black)
- Transfer: -586 ± 20 mV
- Separation: AC514 ± 21 mV (effective value displayed)
AC464 ± 18 mV (average value displayed)

11. When adjustment is required



Note: When voiding occurs on a halftone copy, reduce the separation output.

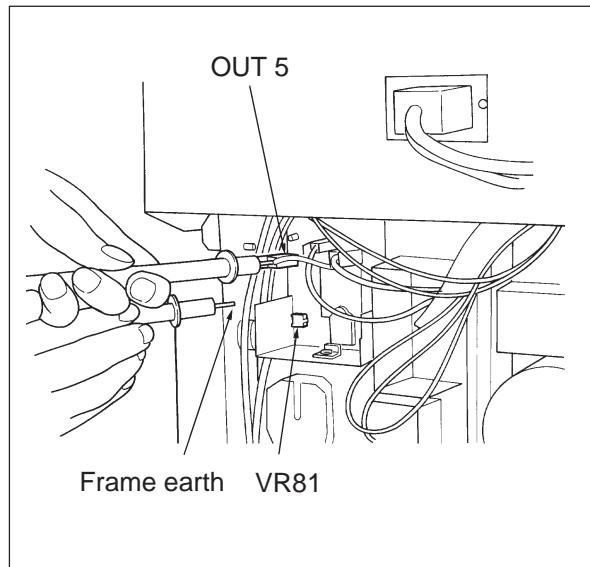
When deficiency in separation from the drum occurs, or the user uses thin paper frequently, increase the separation output. Be careful to avoid over-increasing or over-decreasing separation output.

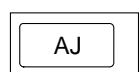
1.11 Checking and Adjustment of Developer Bias Output

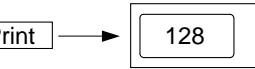
<Adjustment procedure>

(Use code 40 in test mode 05.)

1. Remove the process unit.
2. How to connect digital tester to the machine
 - Connect (+) terminal of digital tester to bias connector (OUT 5)
 - Connect (-) common terminal of digital tester to machine frame.
 - Set digital tester to 1000 VDC range.



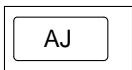
3.  

4.   

5. Check voltage value using digital tester.

—DC200 V ±5 V

6. If adjustment is required, perform adjustment through VR81 (Bias). (Do not touch the zoom keys and the digital keys.)

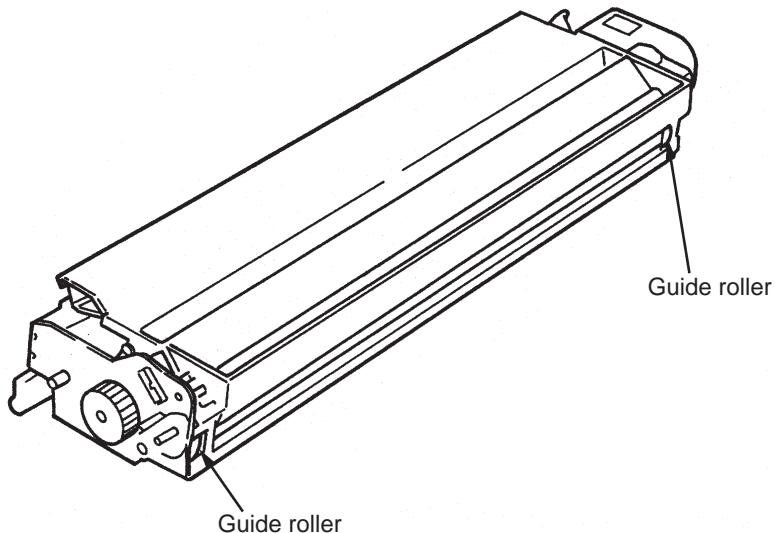
7.  

(Output stop)

Note: If an overall misty effect is observed, even though exposure is sufficient, increase bias output through VR81 (Bias). However, when bias output is over-increased, the image contrast declines, causing a generation of bias leakage, and the carrier tends to stick to the drum easily.

1.12 Drum-to-Sleeve Gap Adjustment

No adjustment is necessary since the guide contacting method is adopted for this machine.

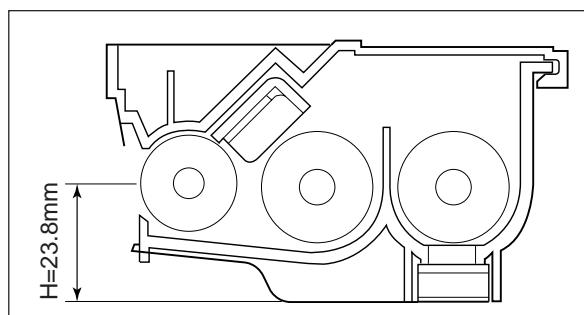
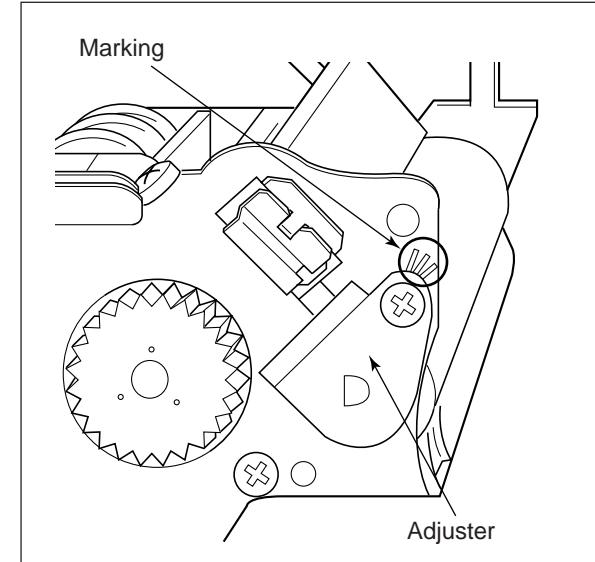


1.13 Development Pole Adjustment

- (1) Take out the developer unit from the process unit.
- (2) Adjustment should be made using the adjuster plate on the rear side:

After loosening the fixing screw of the adjuster plate, move and adjust it, using the adjustment mark as a guide. Note, however, that since the pole position was adjusted using a special jig at the factory, it should be adjusted only when necessary. When its fixing screw needs to be loosened for reasons of disassembly, etc., the initial position of the adjuster plate should be remembered or marked for later reassembly.

However, whenever the magnetic roller is replaced, the adjustment of the pole-position height (H) shall be made first.



1.14 Doctor-to-Sleeve Gap

Jig to be used: Doctor sleeve jig

Procedure:

- (1) Take out the developer unit from the process unit and pour out the developer material from the developer unit.
- (2) Using the "0.50" step of the doctor sleeve jig, rotate the two leveler adjustment screws to adjust the sleeve-to-leveler gap.
- (3) Check that the "0.45" step can move smoothly from the front to the rear along the sleeve-to-leveler gap. Also make sure that the "0.55" step cannot be inserted into the gap. Reinstall the top cover of the developer unit.

Notes:

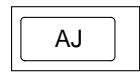
1. When checking or adjusting the sleeve-to-leveler gap, the marking position of the sleeve should be aligned with the leveler position.
2. When reinstalling the top cover, insert the hooks securely and then fix the plate springs firmly.
3. After reinstalling the top cover, check that the rubber seal is placed over the side seals correctly.

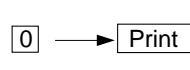
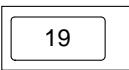


1.15 Auto-Toner Sensor Adjustment

After the developer material is replaced, the auto-toner sensor needs to be adjusted.

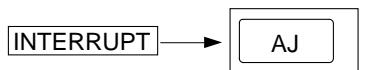
<Procedure> (Code “0” in the 05 adjustment mode)

1.  → 

2.  → (Example) 

3. Approx. 3 minutes later → (Example) 

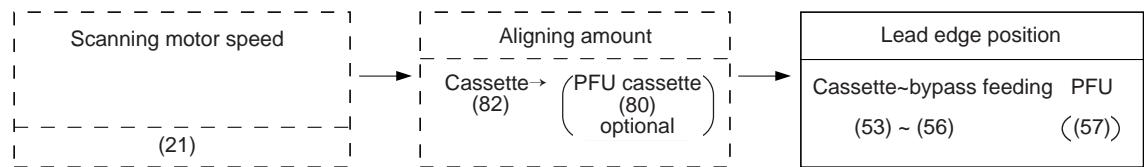
If the value is not 24, make adjustment with zoom keys.

4.  → 

5. Install the toner cartridge.

1.16 Adjustment for Scanning Motor Speed, Aligning Amount and Lead Edge Position

Adjustment procedure:

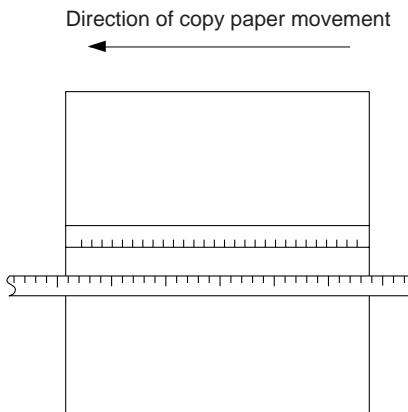


Note: Normally, Adjustments in the dotted-line boxes are unnecessary.

1.16.1 Scanning motor adjustment

(Check and adjustment of the reproduction ratio in the direction of copy movement)

1. Place a ruler on the glass and make a 100% A4-size copy.
2. Two or three minutes later, compare the copied ruler and the actual one.



3. If necessary, make adjustment as follows:

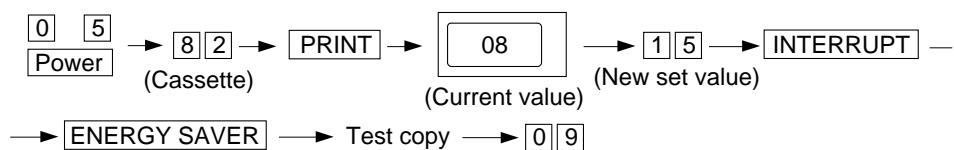


* Larger values make the copy to be enlarged.

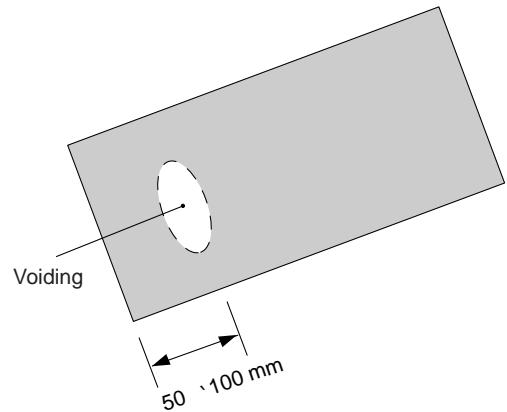
1.16.2 Aligning amount adjustment

If necessary, you can extend the feed roller life by increasing the aligning amount.

<Procedure> (Use codes 82/80 in the test mode "05")



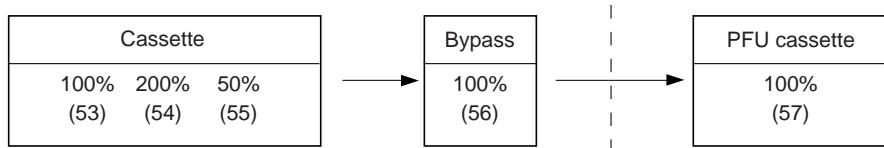
- Check the copy for any image void and if there is any, reduce the new value like "15" → "14" → "13" ... until no image void occurs. Check for no paper misfeeding with the new value.



1.16.3 Lead edge adjustment

Since incorrect lead-edge position can also occur due to paper quality, feed roller surface condition, etc, first check these items before starting adjustment.

Note: The lead edge position of each paper source can be adjusted independently. However, if adjustment for bypass feeding is necessary, make adjustment in order of the cassette → bypass.

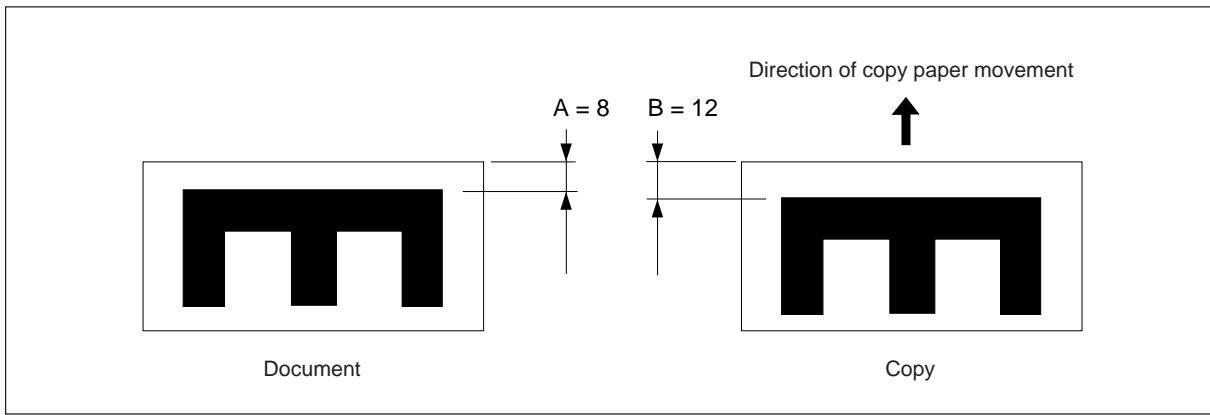


<Procedure> (Use the appropriate codes in the "05" test mode.)

Example: Adjustment for the cassette (100%)

1. **[0] [5]** → **AJ** → **ENERGY SAVER** → Test copy for checking the lead edge position

2. **[5] [3]** → **PRINT** → (Example) **11**



3. Calculate the new set value:

$$\text{New value} = \text{Current value} + \frac{A-B}{0.8} = 11 + \frac{8-12}{0.8} = 11 - 5 = 6$$

4. →

5. →

6. Repeat step 2 onward for manual feeding and PFU cassette.

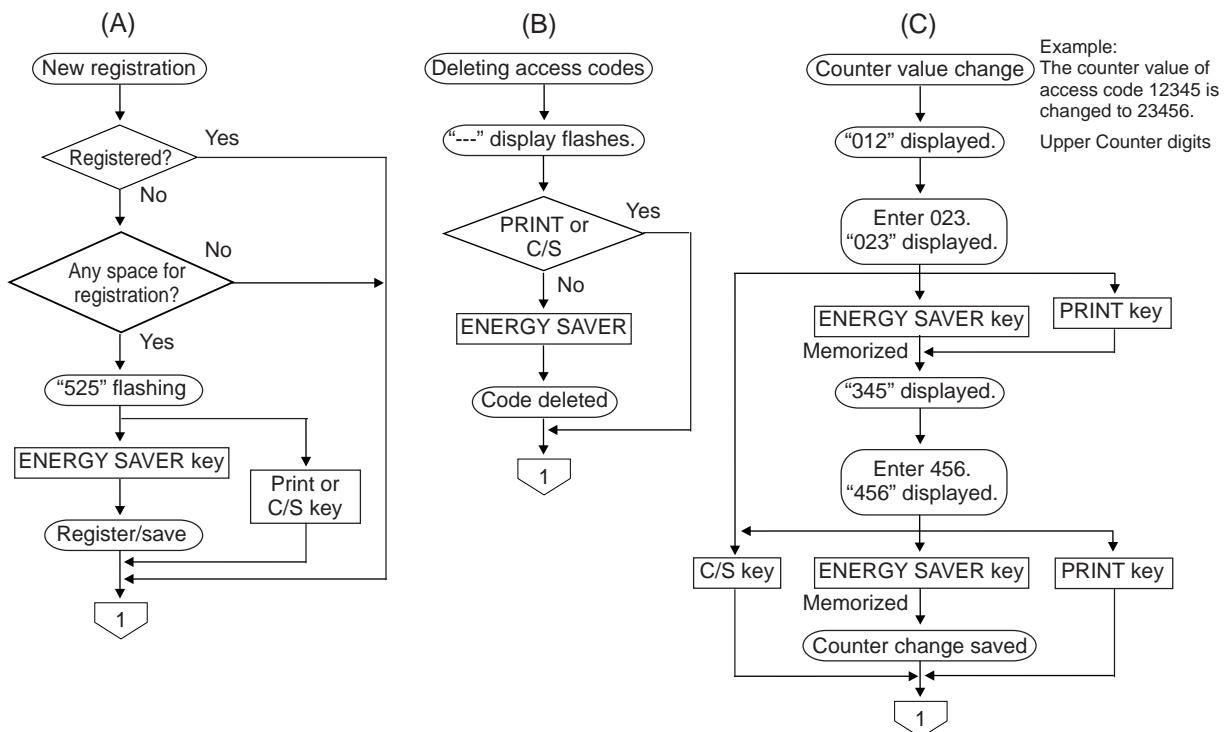
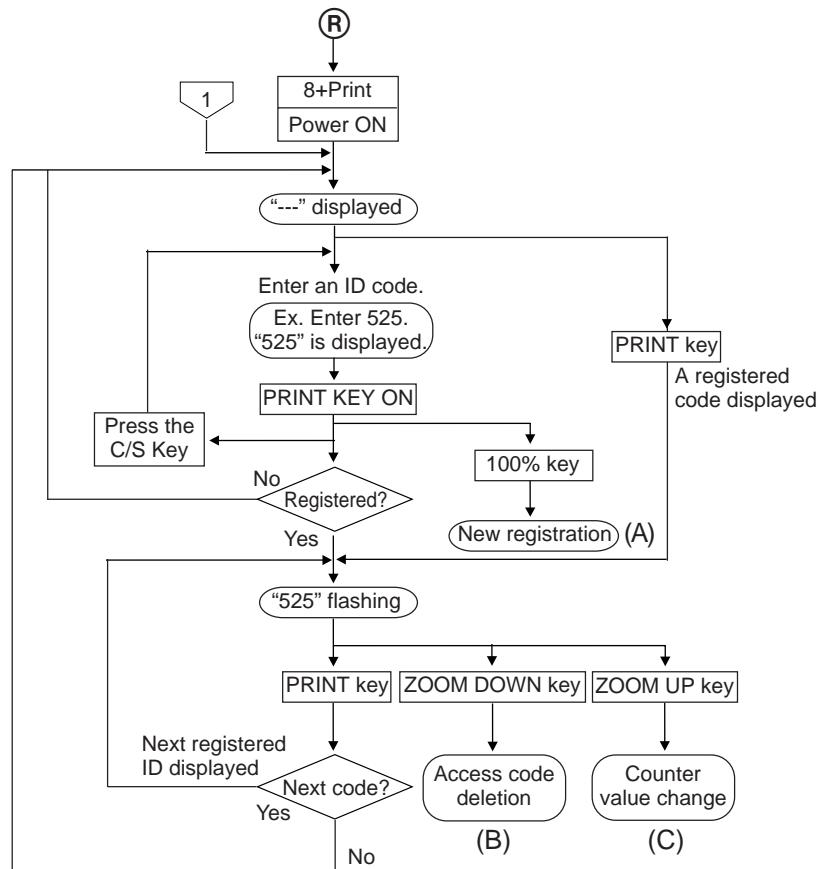
7. Press keys and

1.17 Registering/Changing ID Codes (Access control mode)

When ID codes are registered, copies are classified according to each ID code. To make copies, a registered ID code must be entered using numeric keys.

<Preparation for using the access control mode>

→ → → → → →



1.18 User Exposure-Adjustment Mode

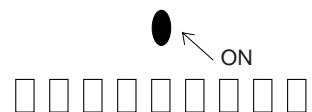
This mode allows the user to perform some of the exposure adjustment modes if he desires to do so.

The user can adjust the following three modes:

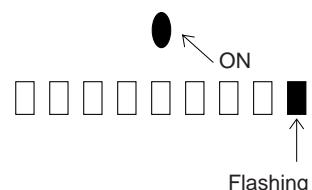
- Manual exposure 100% (05 mode, code 1)
- Auto exposure 100% (05 mode, code 5)
- Photo exposure 100% (05 mode, code 14)

A. Auto exposure adjustment (AJ5)

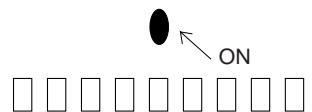
(1) Press the auto-exposure key to make the auto-exposure LED to come on.



(2) While pressing the auto-exposure key, press the ZOOM UP (or ZOOM DOWN) key, and the light MAX (or dark MAX) LED flashes.



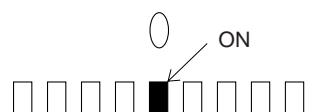
(3) Each time the light MAX (or dark MAX) LED flashes, the AJ value is increased (or decreased) by 2.



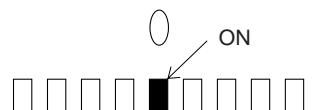
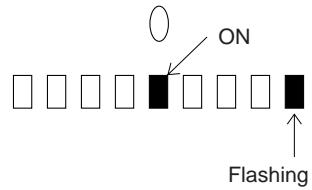
(4) When you release one of the keys you pressed simultaneously, the display goes back to step (1), completing the adjustment.

B. Manual exposure adjustment 100% (AJ1)

(1) Press the auto-exposure key to make the center LED of the manual exposure to come on.

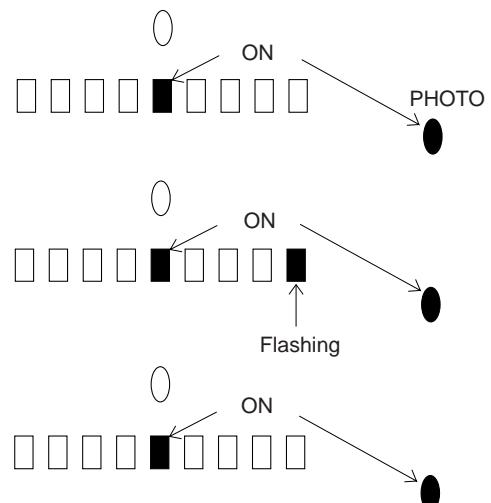


(2) Steps (2)–(4) are same as for the auto exposure adjustment.



C. Photo exposure adjustment 100% (AJ14)

- (1) Press the PHOTO key to make the photo LED and the manual exposure center LED to come on.
- (2) While pressing the PHOTO key, press the ZOOM UP (or ZOOM DOWN) key, and the light MAX (or dark MAX) LED flashes.
- (3) Steps (3)–(4) are the same as for the auto exposure adjustment.



2. PERIODICAL MAINTENANCE

Inspection every 60,000 copies

- (1) Preparation
 - 1) Ask the key operator about the present machine conditions and note them down.
 - 2) Before starting the maintenance work, make and retain a few sample copies for later comparison.
 - 3) Turn off the power switch and disconnect the power cord plug.
- (2) The period inspection should be conducted in accordance with the PERIODIC INSPECTION CHECK LIST shown below. Perform the inspection by referring to the figures, as well as to the explanations in the Service Manual when necessary.
- (3) After the inspection has been completed, plug in the machine and turn the power switch on, and confirm the general operation of the machine by making a few copies and comparing them to those made previously.

Inspection and over-haul every 180,000 copies

- (1) Replace all the cosumables.
- (2) Check to see if there is any damage to parts of the drive section (gear, pulley, timing belt, etc.). Replace parts on principle if damaged.
- (3) Check to see if there is any damage or peeling of adhered parts (tape, Mylar, etc.). Replace any affected parts.
- (4) Check to see if all the switches and sensors operate properly. Replace them if they are not operating properly.
- (5) Clean the inside of the machine thoroughly.

2.1 Periodic Inspection Check List

Symbols used in the Periodic Inspection Check List

Cleaning	Lubrication	Replacement	Date
(A) Cleaning with alcohol	(V) Vacuoline	(20) Every 20,000 copies	Customer's Name
(D) Cleaning with a slightly damp cloth	(H) Heavy-medium oil	(40) Every 40,000 copies	Machine No.
(P) Cleaning with Pit Clean (RC60)	(L) Laune 40	(60) Every 60,000 copies Same thereafter	Inspector
<input checked="" type="radio"/> Cleaning with soft pad, cloth, or cleaner (vacuum cleaner)	Application	(△) Replace in event of deformation or other damage	Remarks
	(SI) Silicone oil		
	(M) Molytherm		
	(W) White grease (Molycoat)		

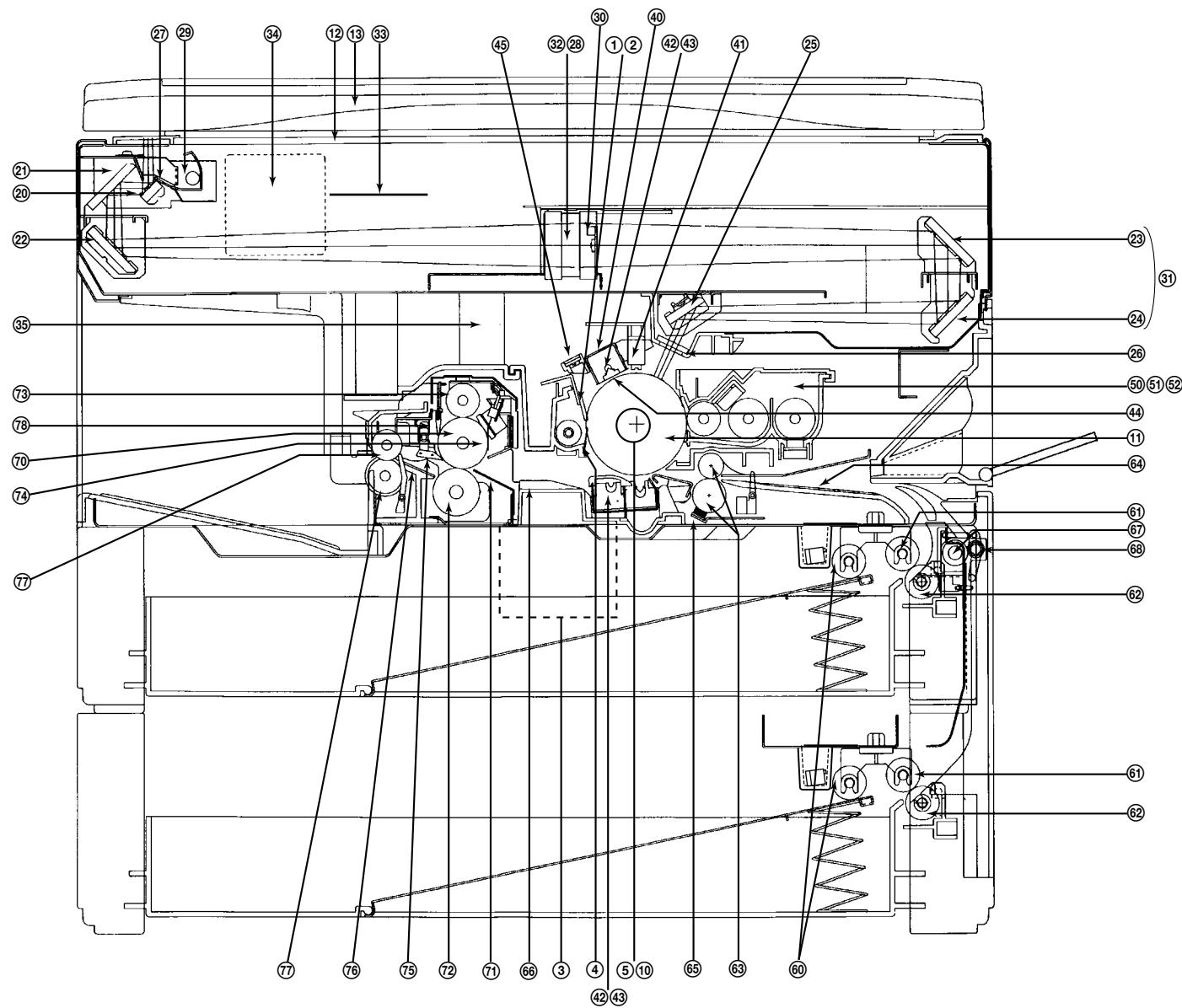
PERIODIC INSPECTION CHECK LIST

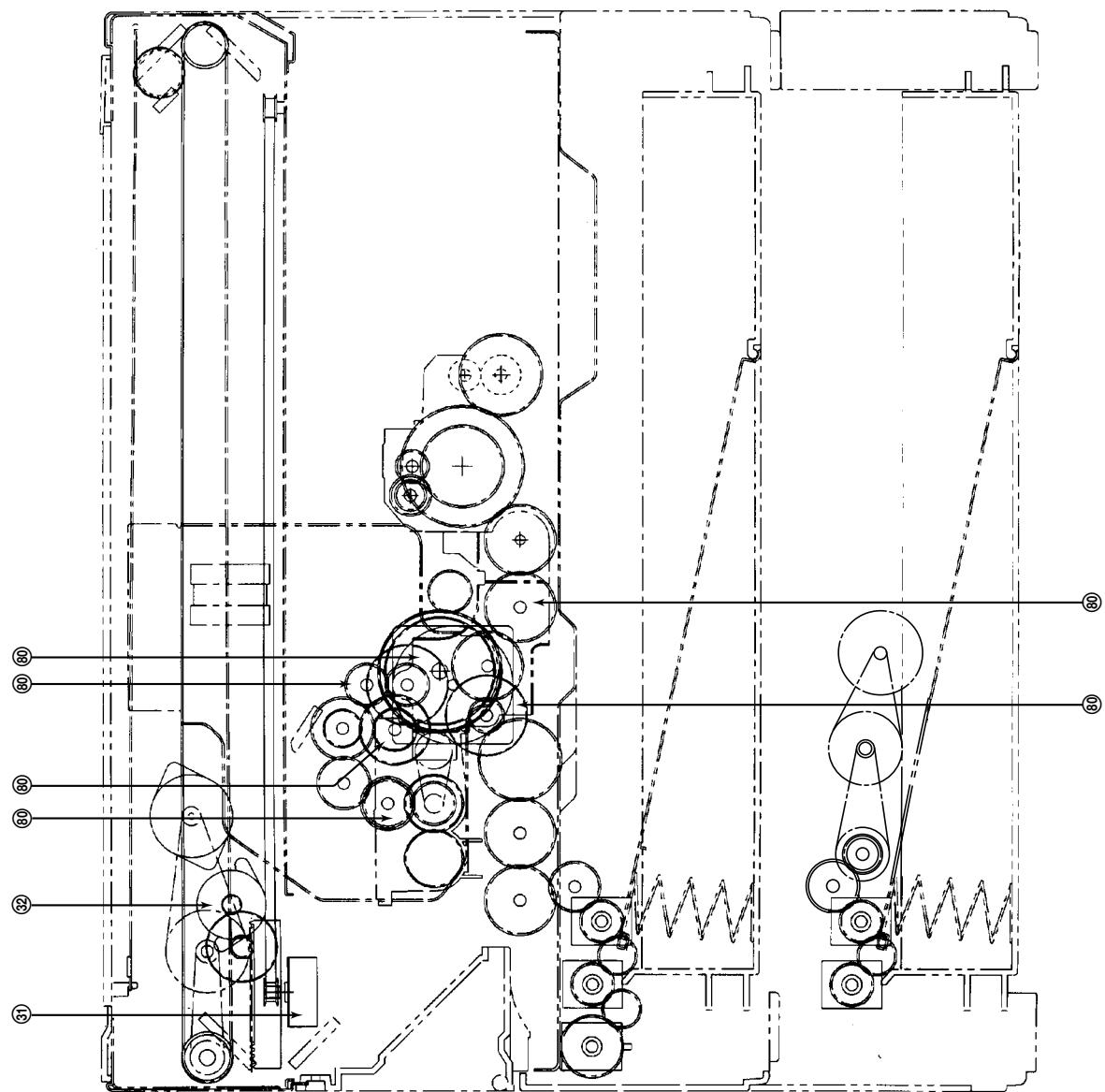
*K=1,000

Section	Item to check	Clean at 10*K copies	Lubricate at 10*K copies	Replace at x *K copies	Check while ON	Remarks
Cleaner	1 Entire Unit	<input type="radio"/>				
	2 Main blade	<input type="radio"/>		⑥0	<input type="radio"/>	*1 (See page 2-6)
	3 Toner bag			⑥0		Key operator item
	4 Recovery blade	<input type="radio"/>				*2
	5 Drum bushings	<input type="radio"/>				
Drum	10 Drum shaft	<input type="radio"/>				
	11 Drum	<input type="radio"/>		⑥0 or more		*3
Original table	12 Glass	<input checked="" type="radio"/>				
	13 Original cover	<input checked="" type="radio"/>				
Optical system	20 Mirror 1	<input type="radio"/> or <input checked="" type="radio"/>				
	21 Mirror 2	<input type="radio"/> or <input checked="" type="radio"/>				
	22 Mirror 3	<input type="radio"/> or <input checked="" type="radio"/>				
	23 Mirror 4	<input type="radio"/> or <input checked="" type="radio"/>				
	24 Mirror 5	<input type="radio"/> or <input checked="" type="radio"/>				
	25 Mirror 6	<input type="radio"/> or <input checked="" type="radio"/>				
	26 Slit glass	<input type="radio"/> or <input checked="" type="radio"/>				(both sides)
	27 Reflector	<input type="radio"/> or <input checked="" type="radio"/>				
	28 Lens	<input type="radio"/> or <input checked="" type="radio"/>				
	29 Exposure lamp			Ⓐ	<input type="radio"/>	
	30 Auto exposure sensor	<input type="radio"/>			<input type="radio"/>	
	31 Reproduction ratio mechanism (mirrors)				<input type="radio"/>	
	32 Reproduction ratio mechanism (lens)				<input type="radio"/>	
	33 Sliding sheets (front/rear)	<input checked="" type="radio"/>		Ⓐ		
Chargers	34 Air filter	<input type="radio"/>		Ⓐ		Replace when heavily stained
	35 Ozone filter	<input type="radio"/>		⑥0		
	40 Charger case	<input type="radio"/>		Ⓐ		
Developer unit	41 LED eraser array	<input type="radio"/>				
	42 Charger wire	<input type="radio"/>		⑥0 Ⓢ	<input type="radio"/>	
	43 Terminal contact	<input type="radio"/>				Use sandpaper as required
	44 Grid	<input checked="" type="radio"/>		⑥0		
	45 Discharge lamp	<input type="radio"/>				
Developer unit	50 Entire unit	<input type="radio"/>				
	51 Developer material			⑥0		*4
	52 Rubber seal	<input type="radio"/>		Ⓐ		

*K=1,000

Section	Item to check	Clean at 10*K copies	Lubricate at 10*K copies	Replace at x *K copies	Check while ON	Remarks
Paper feeding section	60 Pick-up roller	(A)		(△)		
	61 Paper feed roller	(A)		(△)		
	62 Separation roller	(A)		(△)		
	63 Aligning roller	(A)		(△)		
	64 Paper guide	(○)				
	65 Brush	(○)		(△)		
	66 Transport guide section	(○)				
	67 Transport roller (left)	(A)		(△)		MY-1004
	68 Transport roller (right)	(A)		(△)		MY-1004
Fuser unit	70 Teflon roller (upper)	(P)		(120)		*5
	71 Heat roller entrance guide	(P)				
	72 Rubber roller (lower)	(P)		(180)		*6
	73 Cleaning felt roller			(60)		*7
	74 Thermistor	(○ or P)		(△)		
	75 Scrapers (for heat rollers)	(P)		(△)		*8
	76 Heat roller exit guide	(P)				
	77 Exit roller	(A)				
	78 Cleaning blade	(○)				
Drive system	80 Drive gear (teeth)		(S)			





Remarks in the PERIODIC INSPECTION CHECK LIST:

*1. Main blade

If poor cleaning occurs even before the replacement number of copies are made due to the adhesion of paper dust, etc., since the blade edge may have been damaged, replace the main blade as required. Cleaning the edge with a dry cotton can damage it, so wipe the edge lightly using a soft cloth soaked with alcohol; be sure to check for no adhesion of cloth fibers.

*2. Recovery blade

If the edge of the recovery blade is damaged, replace the blade.

*3 Drum

Refer to paragraph 3.2.

*4 Developer material

When the developer material is replaced, be sure to check the auto-toner sensor.

*5 Teflon roller
*6. Rubber roller

} Refer to paragraph 3.5.

*7. Cleaning felt roller

Refer to paragraph 3.3.

*8. Scraper

Scraper whose tip is damaged should be replaced. If you try to scrape off the toner firmly caked on the tip forcefully, it may easily be damaged. So replace scrapers if their tip is heavily stained.

2.2 Oiling Cycle Table

No.*	Item to be oiled	Type of oil	Oiling cycle Number of copies × 1000
80	Drive gears (teeth)	Silicone oil	10

* Numbers correspond with those in the PERIODIC INSPECTION CHECK LIST.

Note: Do not give any oil to rollers, belts and belt pulleys.

2.3 Supplies/Parts Replacement Schedule

No.*	Parts name	Code name	Replacement cycle (Number of copies × 1000)	**Parts List Page/item No.
2	Main blade	PS-BL1550D	60	P17, I34
3	Toner bag	PS-TB1550 PS-TB1550E (for Europe)	20	P6, I38
11	Drum	PS-OD1550	60 or more	P14, I1
35	Ozone filter	—	60	P3, I7
42	Charger wire	—	60	P15, I8/P16, I9
44	Grid	—	60	P15, I13
51	Developer material	PS-ZD1550	60	—
70	Teflon roller (upper)	PS-HR1550U	120	P19, I2
72	Rubber roller (lower)	PS-HR2510L	180	P20, I5
73	Cleaning felt roller	PS-SR1550H	60	P19, I12

* Numbers correspond with those in the PERIODIC INSPECTION CHECK LIST.

** Refer to SERVICE PARTS LIST ED-1550.

2.4 Jig List

Door switch jig	**P100, I1
Drum jig	**P100, I2
Wire holder jig	**P100, I3
Doctor sleeve jig	**P100, I4

** Refer to SERVICE PARTS LIST ED-1550.

3. PRECAUTIONS FOR STORING AND HANDLING SUPPLIES

3.1 Precautions for Storing Toshiba Supplies

A. Toner and Developer

Toner and developer should be stored in a place where the ambient temperature is below 35°C (95°F) and should also be protected against direct sunlight during transportation.

B. OPC Drum

Similarly to the toner and developer, OPC drums should be stored in a dark place where the ambient temperature is below 35°C. Be sure to avoid those places where drums may be subjected to high humidity, chemicals and/or their fumes.

C. Cleaning Blade and Cleaning Felt

These items should be stored in a flat place where the ambient temperature is below 35°C and should also be protected against high humidity, chemicals and/or their fumes.

D. Heat Roller and Pressure Roller

Avoid those places where heat rollers may be subjected to high humidity, chemicals and/or their fumes.

E. Copy Paper

Avoid storing copy paper in a place where the humidity is high.

After a package is opened, be sure to place and store it in a storage bag.

3.2 Inspecting and Cleaning OPC Drum

A. Precautions for Handling

(1) Use of gloves

If fingerprints or oils adhere to the drum surface (which degrades the characteristics of the photoconductor), this affects the quality of the copy image; therefore, do not touch the drum surface with your bare hands.

(2) Removing and reinstalling drums

Since the OPC drum surface is very sensitive, be sure to handle the drum carefully when installing and removing it so as not damage its surface.

Be sure to apply patting powder (lubricant) to the entire surface of the drum before installing the drum into the machine.

Notes:

1. Application of the patting powder is to reduce the friction between the drum and cleaning blade. If the application of patting powder is neglected, the drum and cleaning blade may be damaged.
2. When paper fibers adhere to the cleaning blade edge, they may reduce the cleaning efficiency and, in addition, may damage the blade and the drum. So, if any fibers are found adhering to the blade, be sure to remove them carefully using a soft pad.

3. Installation of Machine and Storage of Drum

Avoid installing the machine in such places where it may be subjected to high temperature, high humidity, chemicals and their fumes.

Do not leave drums in a bright place for a long time, otherwise the drum will fatigue and will not produce sufficient image density immediately after being installed in the machine.

However, this effect may decrease as time elapses.

4. Cleaning the Drum

At periodic maintenance calls, wipe clean the entire surface of the drum using the designated cleaning cotton or soft pad. Use sufficiently thick cleaning cotton so as not to scratch the drum surface inadvertently with your fingertips or nails. Also, remove your ring and wrist-watch before starting cleaning work to prevent accidental damage to the drum.

Be sure not to use other organic solvents or silicone oil as they will have an undesirable effect on the drum.

5. Repairing Scratches on OPC Surface

If a scratch exists on the OPC surface through which the aluminium substrate can be seen, no copy image will be produced on this area and, in addition, the cleaning blade will be damaged so replacement with a new drum will be necessary.

6. Collecting Used OPC Drums

For disposition of used OPC drums, it is recommended to proceed according to the corresponding regional environmental regulations.

3.3 Checking and Replacing Cleaning Felt Roller

(1) Precautions for Handling

Never allow solvents such as thinner, etc. to adhere to the cleaning felt roller.

(2) Poor Heat-Roller Cleaning and Countermeasures

Poor heat-roller cleaning should be judged by the deposited toner on the roller. When the felt roller has heavy toner deposits, the heat-roller surface may be stained with toner. If this happens, replace the cleaning felt roller.

The cleaning felt roller will be gradually degraded due to subjection to the heat from the heat roller over a long period of time; therefore, replace it preferably after about 60,000 copies have been made.

3.4 Checking Drum Cleaning Blade

(1) Precautions for Handling

Pay attention to the following points as the cleaning blade life is determined by its edge condition:

1. Do not allow a hard object to hit on or rub against the blade edge. Do not rub the edge with a cloth.
2. Do not leave oil (or fingerprints, etc.) on the edge.
3. Do not put solvents such as thinner, etc. on the edge.
4. Do not deposit dirt such as paper fibers, etc. on the blade.
5. Do not place the blade near a heat source.

3.5 Checking and Cleaning Upper and Lower Heat Rollers

(1) Precautions for Handling

- Upper Heat Roller

1. Do not leave oil (fingerprints, etc.) on the heat roller.
2. Be extremely careful not to allow a hard object to hit on or rub against the roller because the thin Teflon layer coated on the alminium substrate is easily damaged and, if damaged, will result in poor drum cleaning.

- Lower Pressure Roller

1. Do not leave oil (fingerprints, etc.) on the roller surface.

(2) Checking

1. Check for staining and damage to the heat roller and clean or replace if necessary.
2. Clean the separation claws and check for chipped claws.
3. Check cleaning condition of cleaning felt.
4. Check the thermistor for proper contact with the heat roller.
5. Check the fused condition of the toner image.
6. Check the heat rollers for proper rotation.

(3) Cleaning Procedure for Heat Rollers

When the heat roller becomes dirty, it will cause paper jamming. In that case, wipe the roller surface clean with cotton soaked in alcohol or heat-roller cleaner "RC60" which contains silicone oil. For a better cleaning effect, clean the roller while it is still warm.

Note: Be careful not to rub against the Teflon-coated surface with your fingernails or hard objects because it is easily damaged. Do not use silicone oil on the upper heat roller.

3.6 The bypass roller, separation pad and pick-up roller (1560 only)

The bypass roller, separation pad and pick-up roller should be replaced every 60,000 copies.

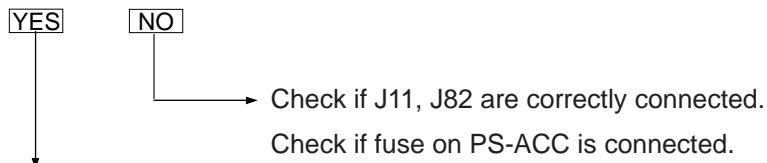
4. TROUBLESHOOTING

(1) **C21** Optical system initialization errors

① Turn the power supply ON/OFF, then visually check that the following units are initialized.

C21

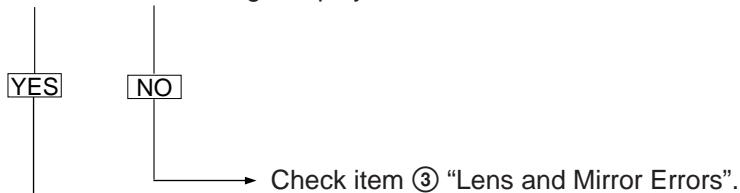
Q1: Does the carriage function? (Follow "YES" if the carriage functions even slightly, or sounds as if it is trying to function.)



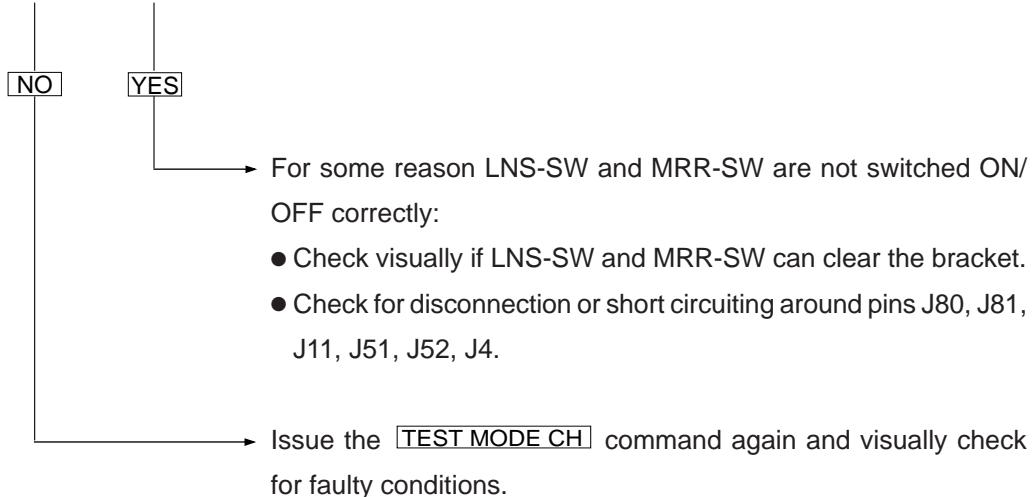
Q2: Is carriage initialization normal?



Q3: Is the Service Call message displayed after the lens and mirror move?



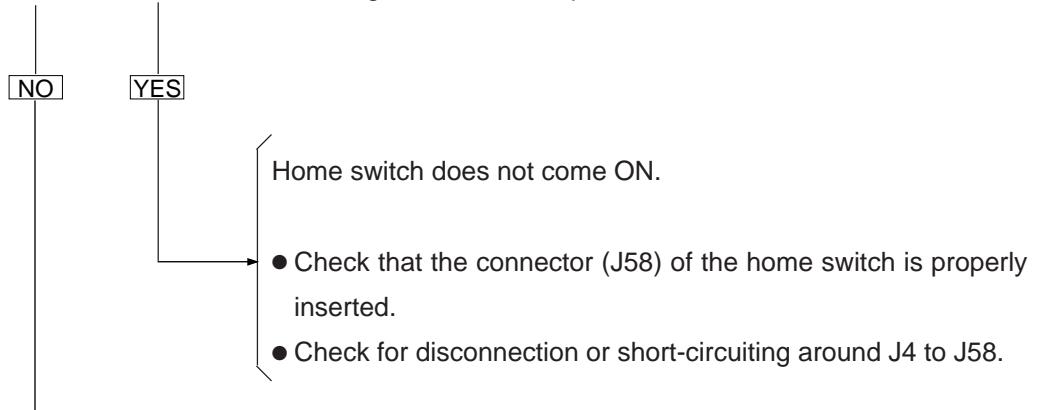
Q4: Use the **TEST MODE CH** (① ④) command code 21 or 22 to move the lens and mirror to the paper-exit position (enlargement position), then turn the power supply ON and OFF again. When the power is turned ON again, do the lens and/or mirror make an out-of-step noise at the home position?



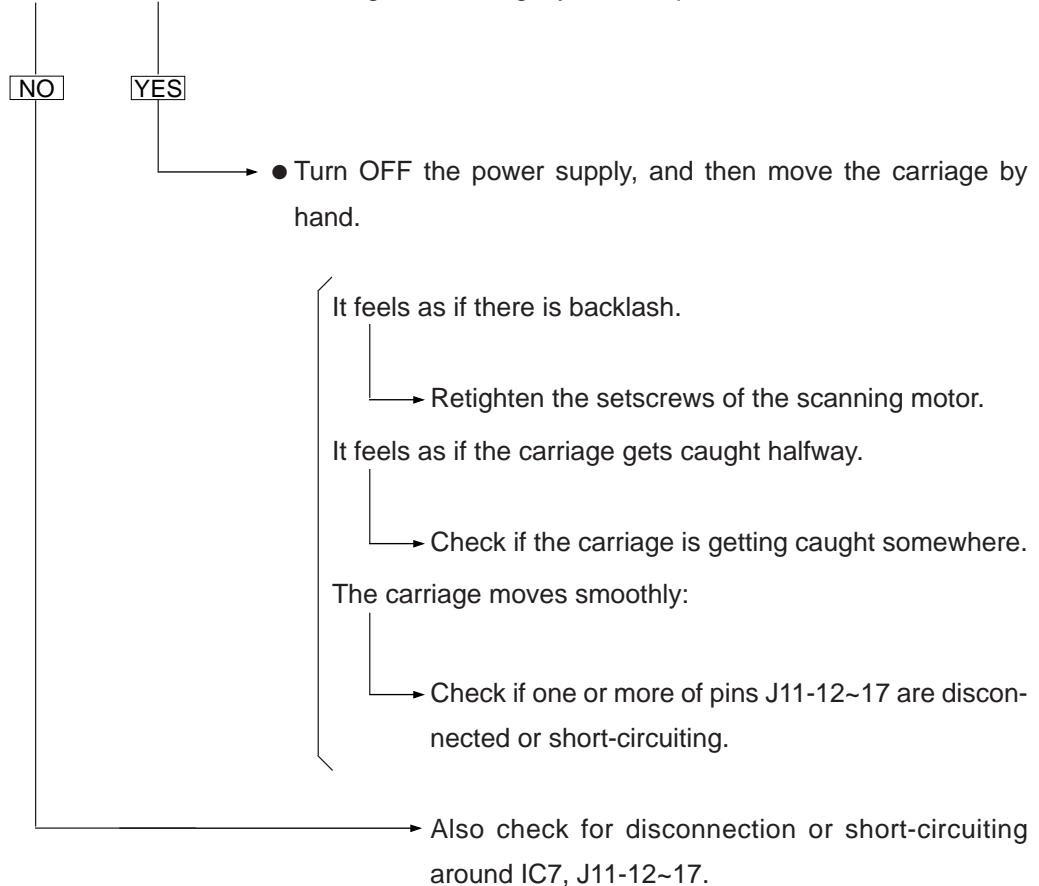
② Carriage errors

Remove the glass and move the carriage to the paper-feed end, then turn ON the power supply and check the following:

Q1: Is there a loud noise after the carriage hits the home position?



Q2: Is there a loud noise after the carriage moves slightly or attempts to move?



③ Lens and mirror errors

Q1: Are the lens and mirror completely inoperable without any out-of-step noise being heard?



- Check if J11 is correctly connected.
- Check if J81, J80 and J83 are correctly connected.

Remove the glass and lens cover.

Press "0" and "4" keys to select **TEST MODE CH**. Using TEST CODE 21 (LNS-MTR), 22 (MRR-MTR), move the lens motor and mirror motor to check that they operate smoothly.

- Should it stop halfway as if caught and an out-of-step noise be heard, check the mechanism.
- The out-of-step noise is heard but there is no movement.

Rotate the motor gears by hand to move the mirror or lens slightly, and carry out the operation test again.

If the out-of step noise is heard again but there is no movement.

- LNS-MTR → Check for disconnection or short-circuiting around pins 18 through 22 of J11 and J82.
- MMR-MTR → Check for disconnection or short-circuiting around pins 1 through 5 of J11 and J81, and J79.

(2) [C41], [C43], [C44] Thermistor disconnection

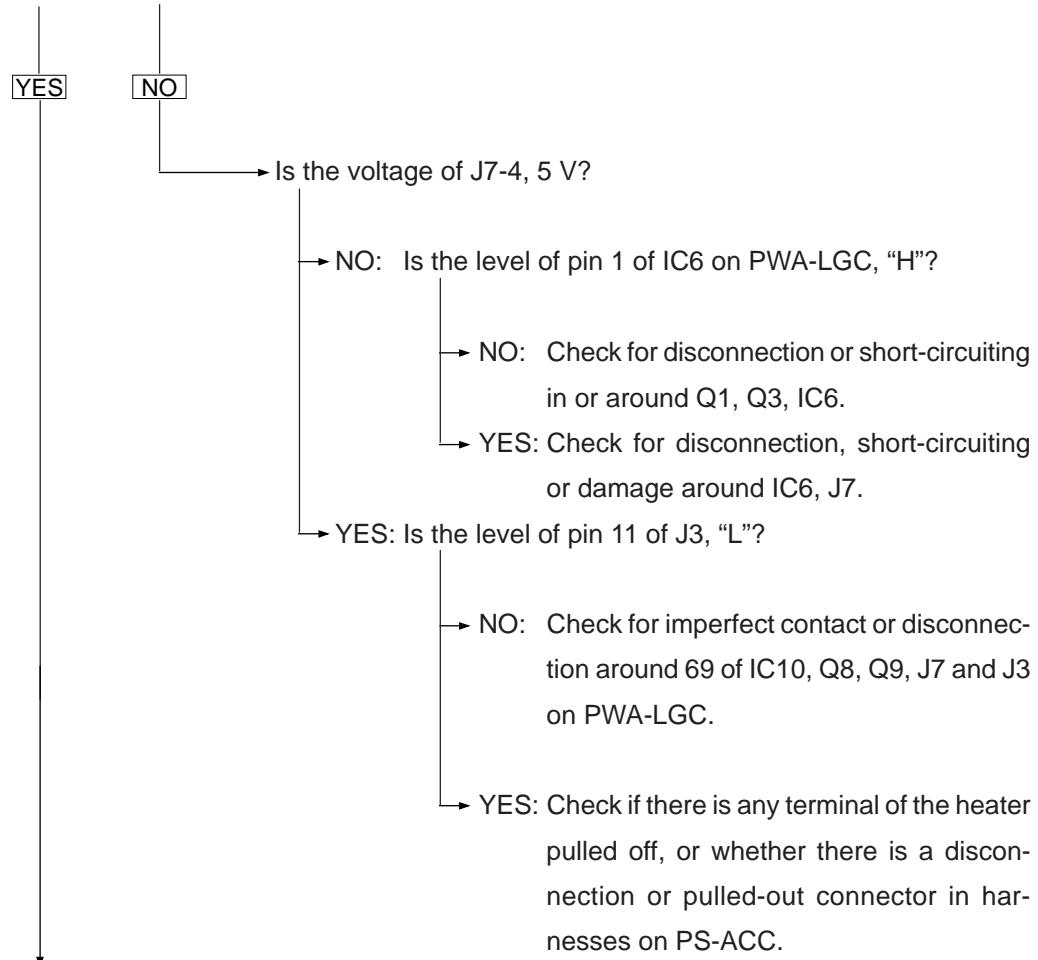
- Open the rear cover, pull out the power supply plug and check the following:

- ① Are any of the connector terminals of J7 and J64 pulled out or discounted?
- ② Is either the thermostat of the heater or the heater lamp disconnected?

Check the above, and if necessary carry out repairs.

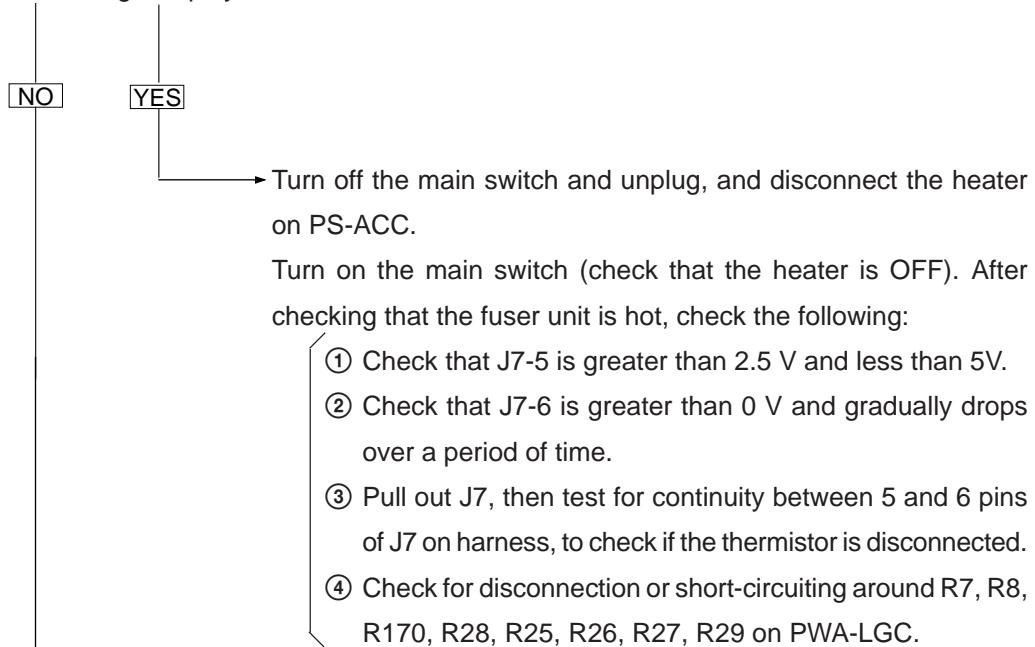
Then connect digital tester between pins 1 and 6 of J7 on PWA-LGC and turn ON the power supply.

Q1: Does the heater come ON?

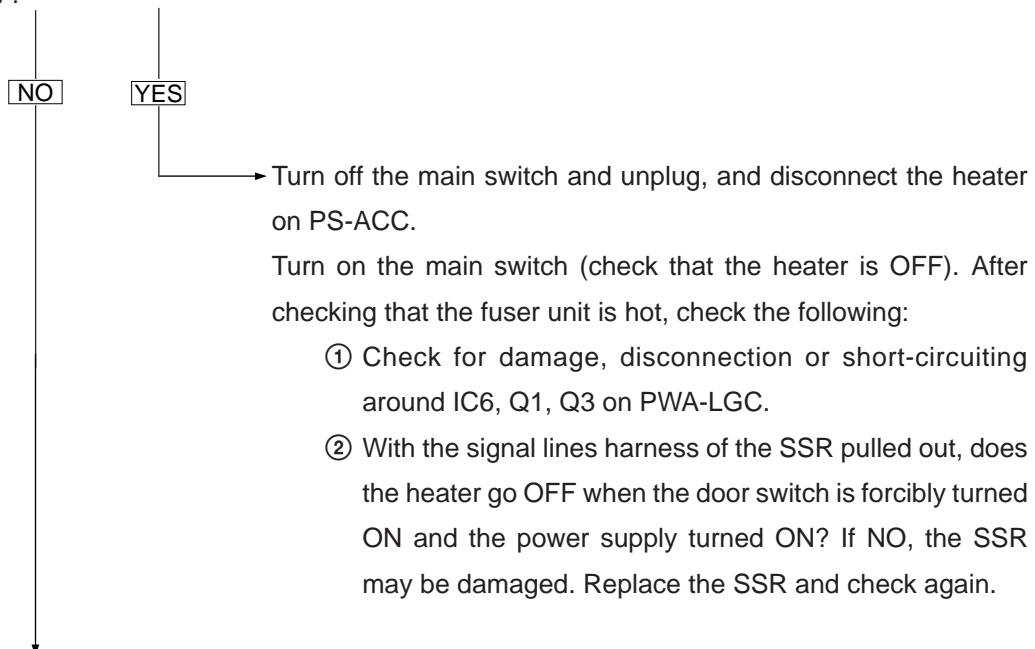


Check the next question (Q2).

Q2: Does the voltage displayed on the tester remain at 0 V?



Q3: Does the heater lamp remain ON even when the voltage displayed on the tester rises above 2.5 V?



Move the connectors and harnesses of J7 and the relay, and check that the voltage displayed on the tester does not drop intermittently.

(3) **[C01] Main motor lock**

- Using code 1 of **[TEST MODE CH]**, turn ON the main motor.
- Check ON/OFF condition of LED on main motor.
 - ① When the LED is OFF:
 - Check if the connector of J531 and J532 on main motor is disconnected.
 - Check if fuse on PS-ACC is blown.
 - ② When the LED is ON and does not flicker:
 - Check that the main motor makes no unusual noise when it rotates.
 - Check for disconnection or short-circuiting around main motor and J10-4, R69, 105, IC10-55 on PWA-LGC, and the harness that runs from J10 to main motor.